Course	:	**Computational Physics I (experimental)**
Module Level	:	Undergraduate
Code	:	FIK204
Sub-heading, if applicable:	:	-
Courses included in the module, if applicable:	:	-
Semester/Term	:	4th / Second Year
Module Coordinator(s):	:	Dr. Khusnul Ain, S.T., M.Si.
Lecturer(s):		Dr. Khusnul Ain, S.T., M.Si. ; Dr. Nuril Ukhrowiya, S.Si, M. Si.; Dr. Riries Rulaningtyas, S.T., M.T.; Yhosep Gita, Y., Y., S.Si., M.Si.
Classification within the Curriculum	:	Compulsory Course / ~~Elective Course~~
Workload	:	2 hours of doing worksheet and pretest preparation, 2 hours of laboratory work, 2 hours of group discussion, searching literature and writing report, 13 weeks per semester, and total of 78 hours per semester 2,6 ECTS*
Credit Points	:	1
Requirement(s)	:	
Learning Outcome	:	LO3 : They have ability to apply concepts and principles of physics for theoretical analysis, modelling and simulation LO5 : They have ability to conduct measurement methods and experiments in physics problems and their applications
Learning Goals/Competences	:	**General Competence (Skill):** Students are able to: a. make the programming algorithm based on concept of repetition, root, and array (1D and 2D) by using GNU Octave Language Program (open source). b. make programming algorithm based on the concept of simple numerical method by using GNU Octave Language Program (open source). **Specific Competence:** Students are able to: a. Identify and recognize fundamental techniques for developing simple programming using pseudo-code, flowchart and algorithm b. understand structure of squential algorithm, conditional, recursion and its combination, array 1D and 2D c. develop simple programming to solve root equation and integration using numerical method.

		All is done by using GNU Octave Language Program (open source).
Contents	:	Introduction of programming language, algorithm and flowchart, data structure, data type, recursion, Function and Procedure, Array 1D, Array 2D, summation and multiplication matrix, Error Analysis, Root of polynomial: Bracket method (Bisection, Regular False) Open method (Newton's, Secant, Brent), Numerical Integration (Simpson's, Simpson's $3/8^{th}$), Romberg.
Soft Skill Attribute	:	Dicipline, can access and process the information, collaboration team.
Study/Exam Achievements	:	Students are considered competent and eligible to pass the course upon obtaining at least 40 of maximum score for the exams (midterm test and final exam), structured activity (group discussion). Final score is calculated as follow: 20% assignment 1 + 20%assignment 2 + 30% midterm + 30% final exam Final grade 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
Forms of Media	:	Powerpoint slides, LCD projectors and whiteboards
Learning Methods	:	Lecture, assessments and group discussion
Literature(s)	:	a. Sandeep Nagar, 2017, Introduction to Octave: For Engineers and Scientists, Aprees. b. Jesus Rogel Salazar, 2013, Essential mathlab and octave, Taylor and Prancis CRC Press c. Capra, S.C., 2012, Applied Numerical Methods with Mathlab for Engineers and sciences, 6 th Ed., Mc. Graw Hill. d. Capra,S.C. and R.P Canale, 2009, Numerical Methods for Engineers, 6 th Ed., Mc. Graw Hill.
Notes	:	*Total ECTS={(total hours workloadx50 min)/60 min}/25 hours Each ECTS is equals with 25 hours