



UNIVERSITAS NEGERI YOGYAKARTA
FACULTY OF MATHEMATICS AND NATURAL SCIENCES
DEPARTMENT OF MATHEMATICS EDUCATION
PHYSICS EDUCATION STUDY PROGRAM

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Bachelor of Physics

MODULE HANDBOOK

Module name:	Monte Carlo Method in Physics
Module level, if applicable:	Bachelor Program
Code:	FSK6359
Sub-heading, if applicable:	-
Classes, if applicable:	-
Semester:	Even
Module coordinator:	Wipsar Sunu Brams Dwandaru, M.Sc., Ph.D
Lecturer(s):	Wipsar Sunu Brams Dwandaru, M.Sc., Ph.D
Language:	Indonesian English
Classification within the curriculum:	Elective Course
Teaching format/class hours per week during the semester:	150 minutes lectures and 180 minutes structured activities per week.
Workload:	Total workload is 136 hours per semester, which consists of 150 minutes lectures, 180 minutes structured activities, and 180 minutes individual study per week for 16 weeks.
Credit points:	2
Prerequisites course(s):	-
Course Outcomes	CO1. To understand the concepts of Monte Carlo method, especially in physics. CO2. To understand the methods of Monte Carlo methods, including random walks, kinetic Monte Carlo, and Monte Carlo simulation. CO3. To know the strengths and weaknesses of different Monte Carlo methods.

	CO4. To apply the Monte Carlo methods in selected physical problems.																		
Content:	The content of this subject includes: a) Definitions of Monte Carlo methods, especially in physics; b) Random walks; c) Kinetic Monte Carlo; d) Monte Carlo simulations; f) Applications of the Monte Carlo methods in selected physical problems.																		
Study/exam achievements:	<p>The achievements of this study are that students are able to understand various Monte Carlo methods including their application in physical problems.</p> <p>The final mark of the subject may be given as follows:</p> <table border="1"> <thead> <tr> <th>No.</th> <th>CO</th> <th>Assessment Object</th> <th>Assessment Technique</th> <th>Weight</th> </tr> </thead> <tbody> <tr> <td rowspan="2">1</td> <td rowspan="2">CO1, CO2, CO3, and CO4,</td> <td>a. Individual Assignment</td> <td>a. Presentation</td> <td>60%</td> </tr> <tr> <td>b. Final Exam</td> <td>b. Project c. Written</td> <td>40%</td> </tr> <tr> <td colspan="4">Total</td> <td>100%</td> </tr> </tbody> </table>	No.	CO	Assessment Object	Assessment Technique	Weight	1	CO1, CO2, CO3, and CO4,	a. Individual Assignment	a. Presentation	60%	b. Final Exam	b. Project c. Written	40%	Total				100%
No.	CO	Assessment Object	Assessment Technique	Weight															
1	CO1, CO2, CO3, and CO4,	a. Individual Assignment	a. Presentation	60%															
		b. Final Exam	b. Project c. Written	40%															
Total				100%															
Forms of media:	Whiteboard, LCD Projector, Laptop/Computer																		
Literatures:	<p>A. Kroese, D.P., et al. 2011. Handbook of Monte Carlo Methods. Wiley.</p> <p>B. Barbu, A. and Zhu, S.-C. 2020. Monte Carlo Methods. 1st Ed. Springer.</p>																		

PLO and CO mapping

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9
CO1		✓							
CO2		✓							
CO3		✓							
CO4			✓						