<table>
<tr><td>Module Name</td><td>:</td><td>Mathematical Physics 4</td></tr>
<tr><td>Module Level</td><td>:</td><td>-</td></tr>
<tr><td>Code</td><td>:</td><td>2053152012/2053252012</td></tr>
<tr><td>Subtitle</td><td>:</td><td>-</td></tr>
<tr><td>Courses</td><td>:</td><td>Mathematical Physics 4</td></tr>
<tr><td>Semester(s) in which the module is taught</td><td>:</td><td>5th/7th</td></tr>
<tr><td>Module Coordinator</td><td>:</td><td>Dr. Suharno, M.Si</td></tr>
<tr><td>Lecturer(s)</td><td>:</td><td>Dr. Suharno, M.Si</td></tr>
<tr><td>Language</td><td>:</td><td>Bahasa Indonesia and English</td></tr>
<tr><td>Classification within the curriculum</td><td>:</td><td>Elective courses</td></tr>
<tr><td rowspan="2">Teaching format/ class hours per week during the semester</td><td rowspan="2">:</td><td>Teaching format : Discussion, Presentation and Team Based Project</td></tr>
<tr><td>Lecture : 2 x 50 minutes/week = 100 minutes/week</td></tr>
<tr><td rowspan="4">Workload</td><td>:</td><td>16 effective weeks/semester</td></tr>
<tr><td></td><td>Lecture : 2 x 50 minutes/week x 16 weeks = 1600 minutes/semester</td></tr>
<tr><td></td><td>Structured assignments : 2 x 60 minutes/week x 16 weeks = 1920 minutes/semester</td></tr>
<tr><td></td><td>Private study : 2 x 60 minutes/week x 16 weeks = 1920 minutes/semester</td></tr>
<tr><td>Credit points</td><td>:</td><td>2 credit points (sks) = 3 ECTS</td></tr>
<tr><td>Requirements according to the examination regulations</td><td>:</td><td>1. A minimum of 75% attendance to attend an exam
2. Further regulated in the Rector’s Decree No. 31/2020 Article 29 and 30
3. Final score is obtained from the score conversion as follows
<table>
<tr><th>Scale of 100</th><th>Score</th><th>Grade</th></tr>
<tr><td>S ≥ 85</td><td>4</td><td>A</td></tr>
<tr><td>80 ≤ S < 85</td><td>3.7</td><td>A-</td></tr>
<tr><td>75 ≤ S < 80</td><td>3.3</td><td>B+</td></tr>
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<tr><td></td><td></td><td>
<table>
<tr><td>70 ≤ S < 75</td><td>3</td><td>B</td></tr>
<tr><td>65 ≤ S < 70</td><td>2.7</td><td>C+</td></tr>
<tr><td>60 ≤ S < 65</td><td>2</td><td>C</td></tr>
<tr><td>55 ≤ S < 60</td><td>1</td><td>D</td></tr>
<tr><td>S < 55</td><td>0</td><td>E</td></tr>
</table>
4. Students who have not achieved a minimum passing standard of 2.00 or (C), have the opportunity to improve their grades through remedial teaching given by the lecturer before giving the results of the assessment (yudisium).
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<tr><td>Prerequisites course(s)</td><td>:</td><td>-</td></tr>
<tr><td>Program Learning Outcome(s)</td><td>:</td><td>PLO-3 To use mathematical, computational, and instrumentation concepts to support understanding of physics concepts</td></tr>
<tr><td>Targeted Learning Outcome(s)</td><td>:</td><td>CLO-1 To analyze the Laplace equation and the temperature state, the heat flow equation using the Schrodinger equation, the wave equation in a vibrating rope, the temperature state in the cylinder and sphere using the partial differential equation, the Poisson equation, and integral transformation using the partial differential equation;
CLO-2 To analyze analytical functions, Laurent series, residual theorem, residual discovery method, integral evaluation with residual theorem, and some conformal mapping applications
CLO-3 To produce a book product containing a collection of questions and discussions about partial differential equations and complex functions</td></tr>
<tr><td>Content</td><td>:</td><td>BK-1 Poisson equation, Integral transformation using partial differential equations, Analytical functions, Laurent series, Residue theorem, Residue discovery method, Integral evaluation with residue theorem, and Some applications of conformal mapping

BK-2 Laplace equation and temperature state, Heat flow equation with Schrodinger's equation, Wave equation on vibrating rope, Temperature state on cylinder and sphere using partial differential equation, Poisson's equation, Integral transformation using partial differential equation</td></tr>
<tr><td>Assessment and Evaluation</td><td>:</td><td>
<table>
<tr><td>Participatory activity (Case Method)</td><td>28%</td></tr>
<tr><td>Project Product (Team-based project)</td><td>28%</td></tr>
<tr><td>Knowledge</td><td>Assignment: 0
Quiz : 0
Mid-term Exam : 22%
Final Term Exam : 22%</td></tr>
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		The evaluation of the courses is carried out by the lecturer and the results of the questionnaires are filled in by the students (Reliability, Responsiveness, Assurance, Empathy, Tangible)
Forms of Media	:	Video Conference, LMS, Slide Presentation, Proyektor, Whiteboard
References	:	Pujayanto. (2018). Diferensial dan Integral Vektor. Edisi I. UNS Press Boas, M.L. (2006). Mathematical Method in the Physical Sciences Third Edition. USA : John Wiley and Sons, Inc K. F. Riley, M. P. Hobson and S. J. Bence (2006). Mathematical Methods for Physics and Engineering. Cambridge University Press The Edinburgh Building, Cambridge, UK. George B. Arfken, J. Weber, Frank E. Harris (2013). Mathematical Methods for Physicists. Academic Press, Waltham, MA 02451, USA Other relevant sources include national and international scientific journals as learning sources