Module name	Course Module
Module level, if applicable	Master of Physics Education
Code, if applicable	32363202
Subtitle, if applicable	-
Course, if applicable	Advanced Mechanics
Semester(s) in which the module istaught	I (Odd semester)
Person responsiblefor the module	Lecturer of Courses
Lecturer	1. Prof. Dr. Mangasi Alion Marpaung
Language	Indonesian Language [Bahasa Indonesia]
Relation to Curriculum	This course is a compulsory course and offered in the 1st semester.
Type of teaching, contact hours	Teaching methods used in this course are: - Lecture (i.e., case-based learning, cooperative learning, and blended learning) - Structured assignments (i.e., essays and case study) - Practice (i.e., computer simulation and case study in laboratorium) The class size for lecture is 20 students. Contact hours for lecture is 26.67 hours, assignments are 64 hours, and privat study is 64 hours
Workload	For this course, students required to meet a minimum of 154.67 hours in one semester, which consist of: 26.67 hours for lecture, 64 hours for structured assignments, 64 hours for private study,
Credit points	5.2 ECTS
Requirements according to the examination regulations	Students should have attended all lectures and submitted all scheduled individual and group assignments prior to the final examination.
Recommended prerequisites	Students should have attended all lectures and submitted all scheduled individual and group assignments prior to the final examination.

Program learning outcomes	PLO 2 Master advanced knowledge of classical physics and modern physics PLO 4. Able to develop learning aids by utilizing advanced information technology and the student environment.

Content	**Students will learn about:** This course is a compulsory course that discusses the essential concepts of classical mechanics in more depth. Study material includes the development of classical mechanics and its applications, Newtonian mechanics – particle motion, oscillations, methods in the calculus of variations, Lagrangian and Hamiltonian mechanics, gravity and central force, dynamics of particle systems, motion in non-inertial frames, dynamics of rigid bodies, and continuous systems : wave equation. Furthermore, to provide a factual understanding, students will be provided with the latest topics on classical mechanics and issues in physics education. Lectures will be conducted using a case-based blended learning approach. Mastery of this study will help students improve their knowledge, take other related scientific lectures, and develop themselves professionally in the field of physics education.
Forms of Assessment	Assessment of the learning process follows the following components: attendance 5%; assignments and presentations 30%; mid-test 30%, and final-test 35%.
Study and examination requirements	**Study and examination requirements:** - Students must attend 15 minutes before the class starts. - Students must switch off all electronic devices. - Students must inform the lecturer if they will not attend the classdue to sickness, etc. - Students must submit all class assignments before the deadline. - Students must attend the exam to get final grade. **Form of examination:** Forms of examination: Essay
Media employed	Powerpoint presentation, Simulation Videos, internet, learning management system (LMS), ZOOM application, and e-learning UNJ.

Reading list	1. S T Thornton and J B Marion (2004) Classical Dynamics of Particles and Systems 5 th Ed., Brooks/Cole [Thornton] 2. G R Fowles and G L Cassiday (2005) Analytical Mechanics 7 th Ed., Brooks/Cole [Fowles] 3. A Bettini (2016) A Course in Classical Physics 2—Fluids and Thermodynamics, Springer [Bettini] 4. M L Boas (2005) Mathematical Methods in the Physical Sciences 3 rd Ed., Wiley [Boas]