Basic Physics Practicum I

Module Name :	Basic Physics Practicum I	
Module Level :	Undergraduate	
Code :	32251021	
Sub-heading, if applicable :		
Classes, if applicable :		
Semester :	1st	
Module coordinator :	Dr. Hadi Nasbey, S.Pd., M.Si	
Lecturer(s) :	Dr. Hadi Nasbey, S.Pd., M.Si. Dr.Firmanul Catur Wibowo, M.Pd. Upik Rahma Fitri, M.Pd.	
Language :	Indonesian	
Classification within the curriculum :	Compulsory course	
Type of Teaching	Contact hours per week during the semester	Class Size
Lecture (Expository, discussion, exercise)	50 minutes	40
Workload	Total workload of this course 45,3 hours (1,5 ECTS) per semester which consist of 13,34 hours (0,44 ECTS) classroom activity, 16 hours (0,53 ECTS) structured task, and 16 hours (0,53 ECTS) per semester.	
Credit points :	1.5 ECTS	
Prerequisite course(s) :	-	
Course Outcomes :	After taking this course the student have ability to : CLO54. Students have an understanding of the objectives, scope of material, strategies and evaluation of lectures (understand and agree on the Practicum contract). CLO55. Determine the value of young's modulus in bar elasticity CLO56. Determine the force constant of a loaded spring undergoing simple harmonic motion. CLO57. Determine the local acceleration of gravity in a mathematical swing. CLO58. Determine the coefficients of viscosity of a liquid, in this case glycerin, by measuring the fall time of balls in the fluid. CLO59. Determine the amount of surface tension of a liquid. CLO60. Determine surface tension by the maximum pressure of bubbles and capillary rise methods. CLO61. Determine the equivalence number of heat and energy, the Joule constant. CLO62. Determine the air humidity of a room using a hygrometer.	
Content :	1. Error Theory	

	a. Error theory b. Statistical data calculation and processing. 2. Elasticity of Rods a. Young's Modulus theory b. Experiment on elasticity of rods c. Data processing and calculation using error theory. 3. Simple Harmonic Motion a. Theory of force constant of springs b. Experiment on simple harmonic motion c. Data processing and calculation using error theory. 4. Mathematical Pendulum a. Theory of gravitational acceleration b. Experiment on the mathematical pendulum c. Data processing and calculation using error theory. 5. Coefficient of Viscosity of Liquid a. Theory of the weight of an object b. Buoyant force and drag force on the liquid c. Experiment on the coefficient of viscosity of liquid d. Data processing and calculation using error theory. 6. Surface Tension I a. Theory of surface tension in a material b. Experiment on surface tension in ropes and soap films c. Data processing and calculation using error theory. 7. Surface Tension II a. Theory of intermolecular forces in the air b. Experiment on the surface tension of an upper layer c. Data processing and calculation using error theory. 8. Joule's Constant a. Theory of energy changes b. Conducting the Joule's constant experiment

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c. Data processing and calculation using error theory.

9. Thermal Conductivity
a. Theory of heat per unit time
b. Specific heat capacity of the receiver
c. Decrease in heat per unit time.

10. Humidity of Air
a. Theory of partial air pressure by water vapor
b. Experiment on air humidity
c. Data processing and calculation using error theory.

11. Flow Calorimeter
a. Flow calorimeter theory
b. Continuous flow of water
12. c. Specific heat capacity.
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<tr><td>Study/exam achievements:</td><td>
Examination are conducted as unit test, as following
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<tr><th>No</th><th>Assesment Object</th><th>Assesment Technique</th><th>Weight</th></tr>
<tr><td>1</td><td>Project Based Learning</td><td>Non-test in the form of a report, Preliminary Report, Final Report</td><td>60%</td></tr>
<tr><td>2</td><td>Midterm Test</td><td>Presentation skills/ argumentation</td><td>15%</td></tr>
<tr><td>3</td><td>Final Test</td><td>UAP</td><td>15%</td></tr>
<tr><td>4</td><td>Attendance</td><td>Presence list</td><td>10%</td></tr>
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<tr><td>Media :</td><td>Computer/laptop, internet, projector, laboratory equipment.</td></tr>
<tr><td>Literatures :</td><td>
1. Tim Dosen Fisika Dasar Jurusan Fisika FMIPA UNJ, “Panduan Praktikum Fisika Dasar I”, Laboratorium Fisika Dasar, Jurusan Fisika FMIPA, UNJ, 2013.
2. Tipler, P. A., & Mosca, G. (2007). Physics for scientists and engineers. Macmillan.
3. Halliday, Resnick, Jearl Walker, “Principles of Physics 9th”, John Wiley, 2011.
4. Indrasari, W., & Rustana, C. E. (2021, February). Development a practicum tools to measure the speed of the air using Arduino Uno Microcontroller. In Journal of Physics: Conference Series (Vol. 1816, No. 1, p. 012109). IOP Publishing.
5. Silva, G. D. S. F., & Villani, A. (2021). The Physics Teaching Practice course and the student-teachers’ activity in the
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	beginning of the supervised practicum at schools+. Caderno Brasileiro de Ensino de Física, 38(3), 1561- 1588.