Module Handbook

Courses	Statistical Physics
Programme	S1 Physics Education
Code	
Semester	5
Group of Course Coordinator	Tjipto Prastowo, Ph.D.
Lecturers	1. Dr. Z.A. Imam Supardi, M.Si 2. Tjipto Prastowo, Ph.D. 3. Drs. Supardiyono, M. 4. Utama Alan Deta, S.Pd., M.Pd., M.Si
The language used	Indonesian
Classification in the curriculum	Compulsory Courses
Learning format / number of class hours per week	Per-week consists of: 3 hours face to face (1 hour face to face = 50 minutes)
Load	3 hours face to face, 3 hours structured assignments, 3 learn to be independent per-week, for 15 weeks = a total of 135 hours face-to-face / semester
credit	3
Precondition	Basic Physics 1 and 2, Mathematical Physics 1 and 2, Modern Physics
Course Learning Outcome	1. Mastering the theoretical concepts of Statistical Physics in general and the theoretical concepts of Classical Statistical distribution (Maxwell Boltzmann) and quantum statistical distributions (Bose Einstein and Fermi Dirac) in depth. 2. Able to formulate solutions to procedural problems related to the application of the theoretical concepts of Classical Statistics and Quantum Statistics distribution to several phenomena of microscopic physical systems.
Courses content	Statistical Physics studies the behavior of microscopic systems with a large number of forming particles through two approaches, namely the laws of classical statistical distribution (Maxwell-Boltzmann statistics) and quantum statistical distributions (Bose-Einstein statistics and Fermi-Dirac statistics). In the lecture, we will explain the differences between the three laws of statistical distribution and the application of the three types of distribution in some cases of physics, for example ideal gases and true gases, bosons and fermion gases, classical and semi-classical gases, Gibbs paradox, classical and semi-classical gas entropy -classic, monatomic and diatomic gases, specific heat of monatomic and diatomic gases, specific heat of solids according to classical and quantum statistics, and the total partition function in the presence of molecular interactions, as well as introduction to the concept of ensemble (micro-canonical, canonical and large canonical).
Attributed soft skill	scientific report public speaking team work

<table>
<tr><td>Learning achievement (assesment)</td><td>Students are considered competent and pass if they get at least a minimum test score of 68 for mid test (SS) and final exam (S), assignments (A), and participation (P), where the final grade (FG) is calculated following the formula:

Final Grade of the course (FG) = 20% P + 30% A + 20% SS + 30%S

Convert the 0-100 scale value to a 0-4 scale and the letters are arranged as follows:
<table>
<tr><th>Letter</th><th>Number</th><th>Interval</th></tr>
<tr><td>A</td><td>4,00</td><td>85 ≤ A < 100</td></tr>
<tr><td>A-</td><td>3,75</td><td>80 ≤ A- < 85</td></tr>
<tr><td>B+</td><td>3,50</td><td>75 ≤ B+ < 80</td></tr>
<tr><td>B</td><td>3,00</td><td>70 ≤ B < 75</td></tr>
<tr><td>B-</td><td>2,75</td><td>65 ≤ B- < 70</td></tr>
<tr><td>C+</td><td>2,50</td><td>60 ≤ C+ < 65</td></tr>
<tr><td>C</td><td>2,00</td><td>55 ≤ C < 60</td></tr>
<tr><td>D</td><td>1,00</td><td>40 ≤ D < 55</td></tr>
<tr><td>E</td><td>0,00</td><td>0 ≤ E < 40</td></tr>
</table></td></tr>
<tr><td>Media form</td><td>1. Power point file
2. e-book file</td></tr>
<tr><td>References</td><td>1. Prastowo, T. 2014. Lecture Notes on Statistical Physics. Unpublished work
2. Pointon, A. J. 1978. An Introduction to Statistical Physics. London, UK: Longmann
3. Beiser, A. 1988. Perspective of Modern Physics. London, UK: McGraw-Hill
4. Serway, R. A. et al. 2005. Modern Physics. California, US: Thomson Learning Inc
5. Kittel, C. and H. Kroemer. 1980. Thermal Physics. New York, US: W
6. Tipler, P. A. 1990. Physics for Scientists and Engineers. New York, US: W</td></tr>
<tr><td>Note</td><td></td></tr>
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