### Subject Code
AP101

### Level
1

### Contact Hours
- Lect: 28
- Tut: 6
- Lab: 8

### Student Effort Hours
120

### Assessment Method
- Coursework: 40%
- Examination: 60%

### Credit Value
3

### Subject Aim:
This subject is intended to:
1. This is the first bridging course in physics of the Foundation Programme for students admitted from mainland. It provides a broad foundation in mechanics and thermal physics, preparing Students to study science, engineering, or related programmes.

#### Learning Outcomes:

**Students will demonstrate their ability to:**

1. solve simple problems in mechanics using vector method;
2. solve problems on rotation of rigid body about fixed axis;
3. define simple harmonic motion and solve simple problems’
4. apply Archimedes’ principle to solve problems in hydrodynamics;
5. apply Bernoulli’s equation to simple problems in fluid flow;
6. explain ideal gas laws in terms of kinetic theory;
7. apply the first law of thermodynamics to simple processes; and
8. solve simple problems related to the Carnot cycle;

#### Syllabus Content:

1. Preparation in mathematics
   - Review of algebra, geometry and trigonometry; Function and graph; Derivative; Integration; Vectors and coordinate system
2. Mechanics
   - Measurement of space, time and mass; Kinematics; Dynamics and Newton’s laws; Force and motion; Impulse and momentum; Work and energy; Conservation of energy; Gravitation field and gravitation acceleration; Systems of particles; Collisions; Rigid body; Rotation; Angular momentum; Oscillations and simple harmonic motion; Pendulum; Statics and elasticity; Hydrostatics and Archimedes’ principles; Bernoulli’s equation.
3. Thermal physics
   - Conduction, convection and radiation; Black body radiation and energy quantization; Ideal gas and kinetic theory; Work, heat and internal energy; First law of thermodynamics; Entropy and the second law of thermodynamics; Carnot cycle; Heat engine and refrigerators.

#### Learning and Teaching Approach (tasks and activities designed to achieve learning outcomes):

1. Lectures are given to deliver the subject outline and key physics concepts to the students. The students will also get the guidance on further reading.
2. Tutorials are provided to help the students gain analytical abilities through problem-solving strategy and also help them strengthen the concepts taught.
3. Laboratories are designed to help the students gain hands-on experience in the operation of equipment and apply their knowledge in the experiments.

#### Assessment (assessment of student performance resulting from learning tasks):

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<thead>
<tr>
<th>Continuous Assessment</th>
<th>Examination</th>
<th>Total</th>
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<tbody>
<tr>
<td>40%</td>
<td>60%</td>
<td>100%</td>
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**Teaching activities:** Lecture (LT)/Tutorial (TU)/Seminar (SM)/Drawing (DW)/Laboratory or Practical (LB)/Studio (ST)/Workshop (WS)/Project (PJ)/Field Study (FS)/Guided Study (GS)/Visit (VS)
Reading List:

Essential Reading and CD-ROM

2. (2000). *Physics CAI* in CD-ROM. USTC.

Reference List