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| Course Title | **Physics I**  |
| Course Code | MANS-102 |
| Course Type | Required |
| Level | 1st Cycle |
| Year / Semester | 1st Year, Fall Semester |
| Teacher’s Name |  |
| ECTS | 5 | Theory | Laboratory | Simulation | Tutorial |
| 3 | --- | --- | ----- |
| Course Purpose and Objectives | The main objectives of the course are:* to introduce students to the basic concepts of mechanics.
* to assist in the development of strong problem-solving skills
* to help cultivate critical thinking in the approach to learning
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| Learning Outcomes | After completion of the course students are expected to: * Assign the correct units of measurement to physical quantities and convert from one unit of measurement to another.
* Analyze the motion of a particle in one and two dimensions using the quantities of velocity, acceleration and displacement.
* Apply Newton’s Laws of motion to solve problems.
* Analyze the equilibrium of extended objects based on the acting forces and moments
* Apply the principles of conservation of energy, linear momentum and angular momentum to solve problems.
* Analyze situations involving fluids in equilibrium and fluids in motion employing Bernoulli’s equation
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| Prerequisites | None | Required | None |
| Course Content | 1. Fundamental Units and Measurement, conversions
2. Vectors
3. Motion in one and two dimensions (displacement, velocity, acceleration)
4. Force and Newton’s Laws of Motion, Friction, Drag force
5. Work and Kinetic Energy Theorem, Potential Energy, Mechanical Energy, Conservation of Mechanical Energy
6. Motion of a System of particles, Center of Mass & Linear Momentum Conservation
7. Moments and Equilibrium
8. Rotational motion and angular momentum
9. Simple Machines, mechanical advantage, efficiency and speed ratio
10. Fluids at equilibrium: Hydrostatic Pressure, Pascal’s Principle Buoyancy
11. Fluids in motion, continuity equation, Bernoulli’s equation
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| Teaching Methodology | Lectures, Tutorials |
| Bibliography | **Required Textbooks/Reading:**

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| **Authors** | **Title** | **Publisher** | **Year** | **Library Access** |
| D. Giancoli | Physics, Principles with applications | Pearson | 7th Edition | Print copy at library |

**Recommended Textbooks/Reading:**

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| **Authors** | **Title** | **Publisher** | **Year** | **Library Access** |
| Ben Crowell  | Conceptual Physics  | <http://www.lightandmatter.com/> |  | Free to download |

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| Assessment | Midterm Exam, Final Exam, Homework Assignments |
| Language | English  |