Abdelhafid Boussouf University Center- Mila **Academic Year: 2024-2025**

Natural and Life Science Institute **Earth and Universe Science**

Tutorial Exercises in Physics 1 / Set 1

Exercise 1:

Provide the dimensions and the units of the various physical quantities listed below:

Energy, power, potential **U**, and resistance **R**.

Exercise 2:

The force (modulus) of gravitation is given by: $\mathbf{F} = \mathbf{G}\frac{\mathbf{Mm}}{\mathbf{r^2}}$ .Using the international units derived from the different quantities

1. Find the equation of dimensions and the unit of the gravitational constant G. With M and m (in kilogram: Kg) and r (in meter: m).

Exercise 3:

To measure the thickness of a hollow cylinder, you measure the inner diameter $\mathbf{D_1}$ and the outer diameter $\mathbf{D_2}$, and you find $D_1 = 19.5 \pm 0.1$ mm and $D_2 = 26.7 \pm 0.1$ mm.

1. Give the measurement result and its precision (relative uncertainty).
2. Calculate the area **A** of a circle with a radius **R** = 5.21 ± 0.10 cm.
3. What is the precision (ΔS/S in %) of the obtained result?

Exercise 4:

To calculate the terrestrial acceleration g of a pendulum, we measure the length of the pendulum **l** as well as the oscillation period **T** we use the law: $\mathbf{T} = \mathbf{2\pi}\sqrt{\frac{\mathbf{l}}{\mathbf{g}}}$

With $l = (1.552 \pm 0.002)$m and $T = (2.50 \pm 0.02)$s

1. Calculate g with its relative uncertainty as well as its absolute uncertainty