LECTURE #1 – SUMMARY
SECTION I. INTRODUCTION: SOME BASIC QUANTITATIVE SKILLS

Section I.1 Units and Dimensional Analysis

SI Units

Quantity	Symbol	SI Unit
length	L	metre (m)
time	T	second (sec or s)
mass	M	kilogram (kg)

Unit Conversion - the Chain Rule

$\rightarrow$ multiply by 1 unit, cancelling numerators and denominators appropriately

Dimensional Analysis

Examine physical quantities and equations with regard to their dimensions only: both sides of an equation must have the same dimensions for it to make sense.

Scientific Notation

Involves a number of reasonable size multiplying some power of ten: $a.bc \times 10^n$

Significant Figures

If $a \neq 0$, then the number of significant figures in "$a.bc\ldots \times 10^n$ " is one plus the number of digits to the right of the decimal point.

(1) When multiplying or dividing, the answer should have the same number of significant figures as the least accurate of the quantities entering the calculation.

(2) When adding or subtracting, the number of digits to the right of the decimal point should equal that of the term in the sum or difference that has the smallest number of digits to the right of the decimal point.

precision – how closely a set of measurements are clustered
accuracy – how close the measurements are to the true value

Section I.2 Scalars and Vectors

Scalar (notation F or *F*)

- any physical quantity which does not have a direction associated with it
- can be represented by a single number

e.g., mass, time, temperature, energy, speed

Vector (notation **F**, $\vec{F}$, or F)

- any physical quantity which does have a direction associated with it
- requires two numbers (size and direction) to specify it

e.g., displacement, velocity, acceleration, force