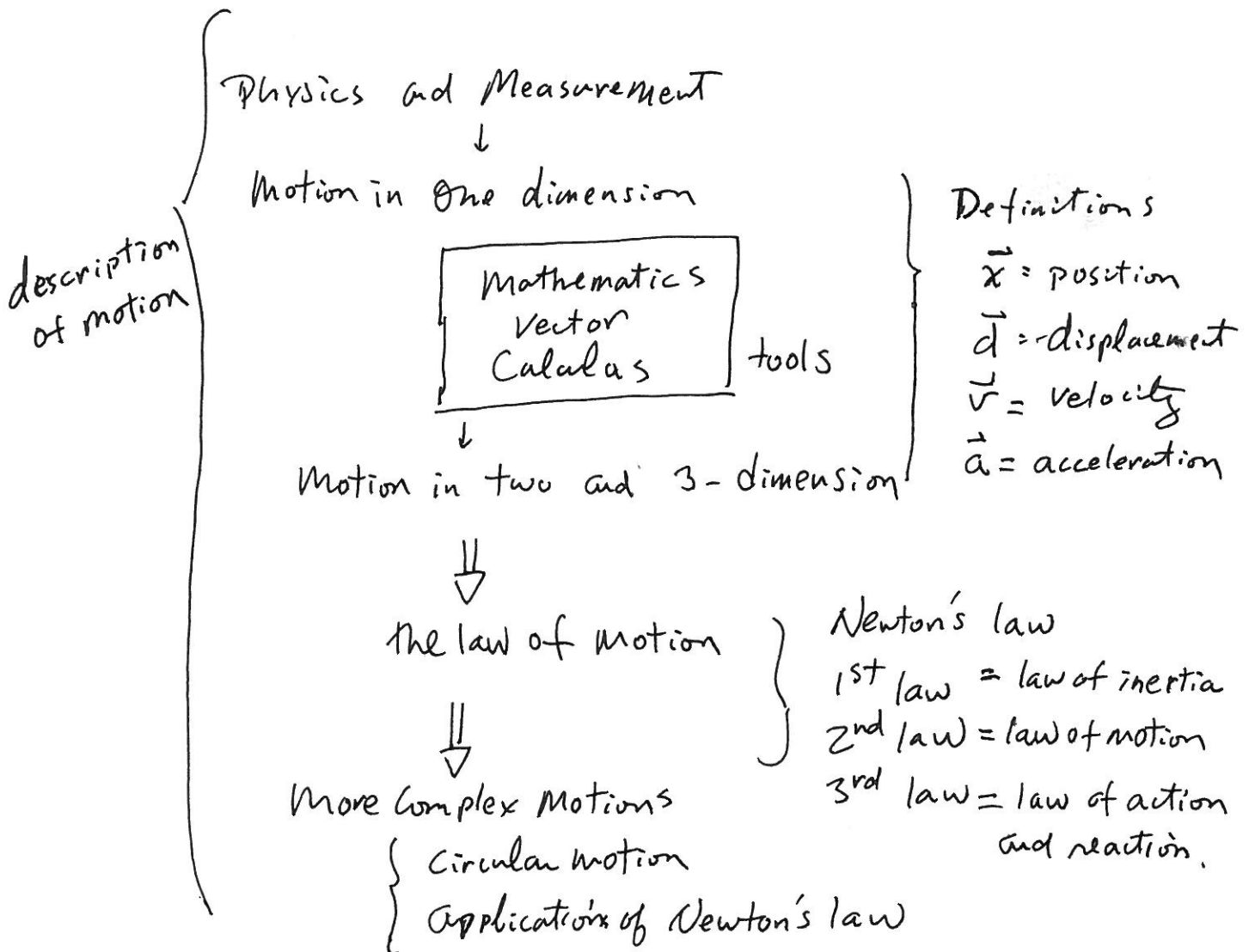
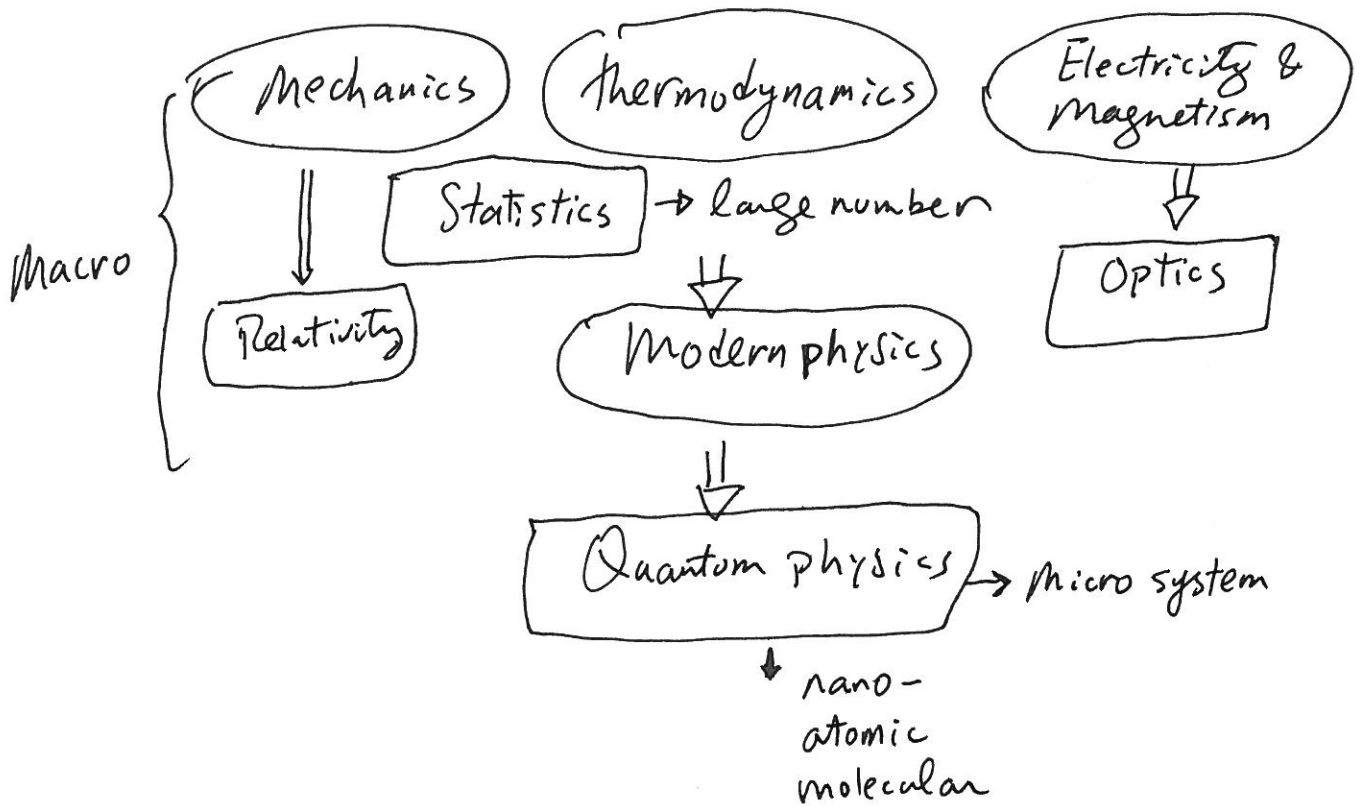


# Chapters 1-6 Overview



# Concept of Energy and Energy transfer

To describe motion and event

**Mechanical energy** : Kinetic energy  
Potential energy

other forms of energies

{ Chemical energy  
atomic energy  
⋮

Concept of Momentum { linear  
Angular



Rotation { Macro Objects : Stars, planets  
Satellites  
micro objects : atoms  
Molecules

Equilibrium

{ Static equilibrium  
Elasticity

⇒ Universal gravitation

⇒ fluid Mechanics

⇒ Solid State physics

⇒ Gas phase physics  
Chemistry



**Bio-X**

## Oscillations mechanical waves

Oscillatory Motion

Wave motion

Sound wave

Superposition and Standing wave

Simple harmonic oscillation  
SHO

One of the most important motion in  
Physics Model

## Thermodynamics

energy, heat  
temperature

↓  
define temperature  
define heat (energy)  
heat transfer

Phase transition: The structure of matter

↓ • The law of thermodynamic

{ 0th law

1st law

2nd law

: entropy

describe the trends  
of the evolution of  
a physics system

↓ The kinetic theory of gas

Statistics

large number system

ideal gas system

E + M

Electricity

Magnetism

Electric charge  
Electric potential  
Electric field

magnetic field,  
magnetic source

Gauss law

Faraday's law

Electric circuit → Capacitance (energy)  
Dielectric  
Current  
Resistance

Inductance (energy)  
Alternating current

Electronic

Electromagnetic wave

Micro electronic

Nano electric

Exchange

Maxwell

Maxwell equation

Combine electricity and Magnetism

wave

Electromagnetic

Wave

↓ light  
Optics

} Geometric optic (image formation)  
wave optics

| Interference of waves  
| Diffraction, Diffraction patterns  
| Polarization

Modern Physics



Relativity — high speed mechanics  $v \approx c$   
Quantum physics  
Atomic physics  
Molecules and Solids  
Nuclear physics  
Particle physics  
Cosmology

Quantum Physics



Microscopic physics : Atomic electrons

Quantum Mechanics

A new language to describe microscopic physics system

{ Particle  
{ wave  
{ Quantization of physics terms