

## Syllabus for Biophysics course

### Lecture 1: July 6<sup>th</sup> Monday 9:30-13:30

Review of core mathematical concepts (powers, exponents, polynomials, linear equations, quadratic equations, systems of equations, trigonometric equations),

### Lecture 2: July 7<sup>th</sup> Tuesday 9:30-13:30

Physical quantities and SI units (scalars, vectors, derived physical quantities) problem solving techniques and introduction to kinematics.

Mechanics -kinematics (translational movements, linear motion, acceleration, gravitational acceleration, angular velocity, periods, frequency and rotation)

### Lecture 3: July 9<sup>th</sup> Thursday 9:30-13:30

Mechanics- Static and Dynamic (Newton's laws, law of universal gravitation, Hooke's law)

### Lecture 4: July 12<sup>th</sup> Sunday 9:30-13:30

Mechanics- Work and Energy (Work, Power, Kinetic energy, Potential energy, Gravitational potential energy, Elastic potential energy, Mass-Energy equivalence)

### Lecture 5: July 14<sup>th</sup> Tuesday 9:30-13:30

Mechanics- Pressure (Density, hydrostatic pressure, partial pressure, barometric pressure)

Mechanics- oscillation (angular frequency, Harmonic oscillation, Eigenfrequency, Damped oscillation, Driven oscillation, Resonance frequency)

### Lecture 6: July 16<sup>th</sup> Thursday 9:30-13:30

Mechanics- Waves (Wavelength, Transverse & longitudinal waves, Linear polarization, Reflection, Interference, Diffraction)

Thermodynamics (Temperature, Heat, Heat capacity, Specific heat capacity, Specific latent heat, Ideal gases).

### Lecture 7: July 19<sup>th</sup> Sunday 9:30-13:30

Electricity- Electrostatics (charge, Coulomb's law, electric field, voltage, electric potential, Capacitors).

### Lecture 8: July 21<sup>th</sup> Tuesday 9:30-13:30

Electricity – Electric current (Conductors, isolators, Ohm's law, electric resistance, conductance, Connecting resistors, Electric power, AC/DC current, RC circuit)

Magnetism and Electromagnetism, Electromagnetic induction

### Lecture 9: July 23<sup>th</sup> Thursday 9:30-13:30

Geometric and wave optics, wave and particle.

Introduction to modern Physics

### Lecture 10: July 26<sup>th</sup> Sunday 9:30-13:30

Course summary, practice problems and problem-solving strategy. Survival guide and time management for 1<sup>st</sup> year students.