

Fourth Year.—The first three Sections of Newton's Principia.—Astronomy. Plane & Physical.—Optics, Formal and Physical, and with Geometrical Proofs of the Classical Propositions:—the Theory and Use of the principal Astronomical and Optical Instruments.

NATURAL PHILOSOPHY, EXPERIMENTAL COURSE.

3rd and 4th year's Students, Tuesday and Thursday, 11 to 12.

This course is descriptive, illustrated by Diagrams and by Experiments with Philosophical Apparatus, supported, however, by a sufficiency of arguments derived from reasoning both inductive and deductive, but the latter divested of Mathematical technicalities. The subjects are,

I. *The Mechanical Sciences*, viz.:

Statics of Solids. Pressure and Equilibrium—Composition and Resolution of Forces—Centre of Gravity—Moments of Force—Virtual Velocities—Statical Principles exemplified in the Mechanical Powers. The Lever, the Wheel and Axle. The Pulley. The Inclined Plane. The Screw. The Wedge. Effects of Friction. Strength of Materials—Practical Applications.

Dynamics of Solids. The Action of Forces producing motion—Instantaneous Forces—Momentum—Laws of Motion—Collision of Bodies—Motion caused by Accelerating and Retarding Forces—Bodies Falling Freely—Confined Motion down inclined planes and in curves. Oscillation and Rotation of Bodies—Deflective Forces—Composition of Motions—Projectiles—Central Forces—Application of Dynamical Principles to the Construction of Machinery.

Hydrostatics.—Properties of Fluids—Equilibrium of Non-elastic Fluids subject to Pressure—of Fluids subject to Gravity—Pressure of Fluids—Equilibrium of Floating Bodies—Pressure on Bodies Immersed—Specific Gravity—Pneumatics or Laws of Elastic Fluids—The Atmosphere—Temperature and Heat—Evaporation—Hydrostatic Instruments and Machines.

Hydrodynamics.—Fluids in motion—From Vessels under Atmospheric Pressure—Velocity of the Flow—Law compared with that of Bodies Falling Freely—Form of the Jets—Hydraulics or Flow of Fluids through Pipes—Resistance of Fluids—Various Machines.

II. *Acoustics.* The Production and Transmission of Sound—Velocity of Sound—Divergence—Reflexion of Sound—Musical Sounds—Interference and Decay of Sounds—Illustrations.

III. *Optics.*—Catoptrics or Reflexion of Light—Dioptrics or Refraction of Light—Aberration—Physical Optics—Decomposition of Light—Polarization of Light—Theory and Use of Optical Instruments.

IV. *Astronomy.*—Apparent Motions of the Celestial Bodies—Real Planetary Motions—Physical Causes—Theory and Use of Astronomical Instruments.

V. *Electricity.*—Electro-Statics and Electro-Dynamics applied to Electricity, regarded as a Fluid—Magnetism—Polarity of Matter—Crystallization—Galvanism—Thermo-electricity, &c. Experiments.

NATURAL HISTORY.

Professor J. W. Dawson, M.A., F.G.S.

(This course is imperative in the Fourth year, optional in previous years.)

Tuesday, Thursday and Saturday, 4 to 5.

In the months of September and October, a Preparatory Course will be given, including Lectures on Physical Geography and excursions in the environs of Montreal.

In the remaining six months of the Session, a Course of Lectures will be delivered, embracing the following subjects:—

Zoology, including comparative Physiology, and Classification of Animals, with notices of their habits and Geographical distribution, and in particular of the Fauna North of America.