

**SHORT INTENSIVE BIOLOGY COURSE FOR STUDENTS ENTERING  
POZNAN UNIVERSITY OF MEDICAL SCIENCES, POLAND**

**INTRODUCTION OF RUDIMENTARY BIOLOGICAL ISSUES IN ENGLISH**

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**I. CHEMISTRY OF LIFE**

1. Elements of life
2. Importance of water
3. Carbohydrates, lipids & proteins
4. Enzymes
5. Nucleic acids structure

**II. CELLS**

1. Cells theory
2. Prokaryotic cell structure
3. Eukaryotic cell structure
4. Differentiation and functional specialisation of cells; review of tissues
5. Membranes
6. Cell division & mitosis
7. Meiosis

**III. NUCLEIC ACIDS & GENETICS**

1. DNA replication
2. Transcriptions & translation
3. Chromosomes genes & alleles
4. Gene and chromosomal mutations
5. Theoretical genetics - introduction
6. Applied genetics : Mendelian inheritance (mono and dihybrid crosses), multiple alleles, codominance, autosomal linkage, sex-linkage, Morgan`s theory, gene mapping, polygenic inheritance
7. Genetic engineering, DNA fingerprinting, gene therapy
8. Applications of genetics to agriculture and horticulture

**IV. HUMAN HEALTH & PHYSIOLOGY**

1. Digestion & nutrition
  - 1.1 Biochemistry of nutrition
  - 1.2 Digestion
  - 1.3 Diet & health
  - 1.4 Absorption of digested foods
  - 1.5 The functions of the liver
2. The transport system
  - 2.1 Heart structure and its cycle
  - 2.2 Control of the heart beating
  - 2.3 Relationship between the structure and functions oh blood vessels

- 2.4 Composition and functions of the blood
- 2.5 Artherosclerosis and the causes of coronary thrombosis
- 2.6 Tissue fluid and lymph
- 3. Defense against infectious disease
  - 3.1 Agents that cause infectious disease
  - 3.2 Types of defence
- 4. Gas exchange and respiration
  - 4.1 Structure of human gas exchange system, mechanism of ventilation
  - 4.2 Aerobic respiration
  - 4.3 Anaerobic respiration
  - 4.4 Comparison and contrasting respiration and photosynthesis as oxidation and reduction processes
- 5. Homeostasis
  - 5.1 Regulation of temperature
  - 5.2 Hormonal control
  - 5.3 Excretion
  - 5.4 The human kidney
  - 5.5 The human nervous system – Central and peripheral; autonomic and somatic
  - 5.6 Transmission of nervous impulses
  - 5.7 Neurotransmitters and synapses
  - 5.8 Muscles and movement
- 6. Reproduction
  - 6.1 Production of gametes
  - 6.2 Fertilisation and pregnancy
  - 6.3 Contraception and family planning

## V. NEUROBIOLOGY & BEHAVIOUR

- 1. Introduction and examples of behaviour
- 2. Perception of stimuli
- 3. Innate behaviour
- 4. Learned behaviour
- 5. Social behaviour

Recommended book : BIOLOGY for the IB Diploma by Andrew Allot, 2001, Oxford University Press, ISBN 0 19 914818 X