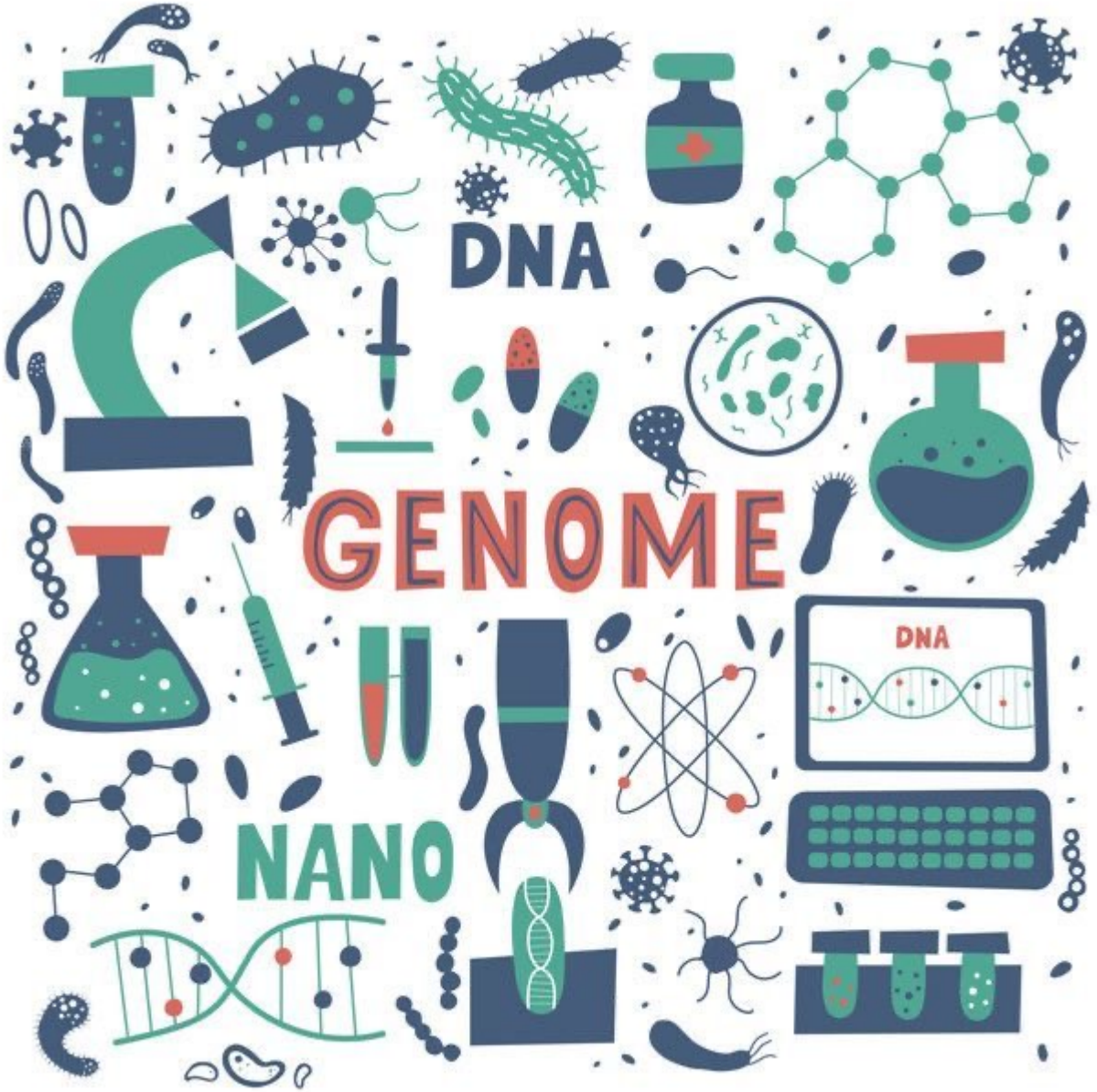
Elements of Chemical and Molecular Biology

Course outline



Course outline

- **Introduction to the course**
- **The molecules of life**
  - Lesson 1 – Water, pH and buffers
  - Lesson 2 – Recognizing macromolecule
  - Lesson 3 – Nucleic acid polarity and structure
  - Lesson 4 – Protein polarity and structure
- **The cell and how it works**
  - Lesson 5 – Cellular chemistry, reaction thermodynamics and metabolic pathways
  - Lesson 6 – Enzymes and reaction kinetics
  - Lesson 7 – Cellular organization
  - Lesson 8 – Cell division
- **Information transfer in biology**
  - Lesson 9 – Genes and DNA rules
  - Lesson 10 – DNA replication
  - Lesson 11 – DNA transcription
  - Lesson 12 – RNA translation
- **Inheritance and Genetics**
  - Lesson 13 – DNA mutations and their outcome
  - Lesson 14 – Allele segregation
  - Lesson 15 – Punnett squares
  - Lesson 16 – Pedigrees

Course outline

- **Genetic engineering – Recombinant DNA technology**
  - Lesson 17 – Restriction enzymes
  - Lesson 18 – Vectors and ligation enzymes
  - Lesson 19 – Polymerase chain reaction (PCR)

- **The biological defense system**
  - Lesson 20 – Basic Immunology: the first line of defense
  - Lesson 21 – Basic Immunology: the second line of defense
  - Lesson 22 – Basic Immunology: the third line of defense

- **Final considerations and end of the course first part**
- **Laboratory techniques and hands-on sessions**