

LEARNING OUTCOMES

On completion of the course, the student should be able to:

- Account for structure formation of and function of DNA, RNA and proteins
- Understand the principles for gene regulation in prokaryotic and eukaryotic cells
- Understand Mendelian genetics, family tree, gene cloning, restriction endonucleases, DNA-sequencing, PCR
- Understand how modern gene technologies are used to elucidate genetic issues.
- Critically analyse, evaluate and compile received results

CONTENT

The course gives knowledge of genetic engineering technology: the molecular methods and applications of recombinant DNA technology in medicine, agriculture, biology, forensics, and other areas of technology. The possibilities, limitations and potential ethic concerns of genome manipulations of the genetic engineering are discussed.

Main topics:

- Bacterial extra-chromosomal elements
- Plasmid DNA purification
- Enzymes in DNA engineering
- Bacterial cloning vectors
- Gene cloning and identification
- Polymerase Chain Reaction

- Gene expression and protein purification
- Creating mutations
- Eukaryotic cloning vectors
- Animal cell engineering
- Transgenic animals
- Transgenic plants
- Genome editing and post-genome analysis
- Gene therapy
- Forensic genetic approach