

Approval: 9th Senate meeting

Course Name: Disease Biology

Course Number: BY518

Credit: 3-0-0-3

Prerequisites: IC 136 - Understanding Biotechnology & its Applications or Consent of Faculty member

Students intended for: B. Tech. 3rd and 4th year, MS/M. Tech., Ph.D.

Elective or Compulsory: Elective

Semester: Odd/Even

Course objective:

This course covers current understanding of, and modern approaches to human disease, emphasizes the cellular, immunological and molecular basis of infectious, autoimmune, metabolic and genetic disorders. This course will give the students insights of prominent human diseases; this knowledge can be applied to solve associated problems in the field of biotechnology and biomedicine.

Learning outcome of the proposed course:

1. Learner will be able to list important human diseases and explain their pathophysiology/immunopathology
2. Learner will be able to list modern immunological/cellular diagnostic tools available for different diseases and explain their working principles
3. Learner should be able to differentiate between infectious/autoimmune and genetic disorders

Course content:

Module 1 [10 lectures]

Infectious diseases:

Bacterial: Tuberculosis, Urinary tract infection (E. coli), Pneumonia (S. aureus), Typhoid, Gut infection (H. Pylori); *Viral diseases:* Cough and cold (influenza), Hepatitis, Measles, Mumps, Japanese encephalitis, Polio, HIV; *Parasitic diseases:* E. histolytica, Leishmaniasis, Malaria, Ascaris, Giardiasis, Filariasis, Cysticercosis

Module 2 [8 lectures]

Autoimmune diseases: Arthritis, Lupus, Atherosclerosis, Alzheimer

Module 3 [12 lectures]

Metabolic diseases: Diabetes, Obesity, Cancer

Module 4 [12 lectures]

Genetic diseases: Haemophilia, Down syndrome, Angelman syndrome, Colour blindness

Text & Reference Books:

- Cell Physiology Source Book: A Molecular Approach by Nicholas Sperelaki 4th edition
- The Biology of Disease, Jonathan Phillips (Editor), Paul G. Murray (Editor), Paul Kirk (Editor). 3rd edition. Wily Publications.
- Strachan, Tom, and Andrew P. Read. Human Molecular Genetics. 2nd ed. New York, NY: John Wiley & Sons Inc., ISBN: 9780471330615
- The Biology of Alzheimer Disease, Edited by Dennis J. Selkoe, Harvard Medical School; Eckhard Mandelkow, Max-Planck-Unit for Structural Molecular Biology; David M. Holtzman, Washington University School of Medicine. ISBN 978-1-936113-44-6.
- Additional handouts and references from peer reviewed publications will be provided.