Syllabus of Ph.D Course work

Paper- I

Maximum marks: 100
Examination marks:  70
Sessionals:  30

Program Goals

At the completion of this program in Tuberculosis & Respiratory Medicine, students will:

1. Demonstrate advanced knowledge in the field of Tuberculosis & Respiratory Medicine.

2. Demonstrate independent critical and analytical thinking, both within their field of study, and beyond for the use of their knowledge for service to human health.

3. Identify and suggest possible solutions to ethical dilemmas that occur in their work and field of study, and understand the importance of professional ethics in all aspects of scientific communication and laboratory work.

4. Demonstrate competence in the laboratory, including application of the scientific method and appropriate use of basic and state of the art laboratory tools and techniques.

5. Demonstrate written and oral skills necessary for communication of research, knowledge, and ideas to scientists and non-scientists alike.
Unit-I: Development and physiology of lung

Stages of lung development, Tissue interactions and lung development, Ventilation: Lung volume, Total and alveolar ventilation, Physiological dead space, Inequality of ventilation; Blood flow: Pressure of the pulmonary circulation, Pulmonary vascular resistance, Distribution of pulmonary blood flow, Active control of the pulmonary circulation, Damage to pulmonary capillaries by high wall stresses; Blood-gas transport: Oxygen, Carbon dioxide; Gas exchange: Oxygen sensing.

Unit-II: Tuberculosis


Unit-III: Techniques

PCR and its types, applications of PCR, Real Time PCR, RT-PCR. Gel electrophoresis: Agarose and PAGE, native PAGE, SDS-PAGE, Southern, Northern and Western blotting, Principle & application of gel filtration, Ion exchange & hydrophobic interaction chromatography, Gas Chromatography, High Performance Liquid Chromatography (HPLC), ELISA, DNA microarray.

Unit-IV: Research Methodology, Quantitative methods, Computer Applications, Biostatistics and Bioinformatics

Meaning and objectives of research, Criteria for selection of a research problem, How to generate and test the research hypothesis, Meaning of literature survey, Experimental design, Validation of methods, Processing analysis and interpretation of data. Conclusion of research. Ethic in research, Application of internet explorer, search engines, reference manager/end note and Microsoft office. Student’s ‘t’ test, Chi-square test, ANOVA, HBSS Multiple range tests, Standard deviation.
Paper-II (Based on Ph.D thesis work)

Maximum marks: 100
Examination marks: 70
Sessionals: 30

Name of the candidate: Shahnawaz Mohd

Supervisor: Prof. Mohammad Shameem

Unit I: Nanotechnology: definition of nanoparticles, types of nanoparticles, classification of nanoparticles, nanoparticle morphology, characteristics of nanoparticles, and sources of nanoparticles.

Unit II: Applications of Nanotechnology: Anti-mycobacterium properties of Solid lipid nanoparticles, size dependent antibacterial properties of nanoparticles, and other medical application of nanoparticles.


Unit IV: Review of literature/published work


2. Ehsan Aboutaleb; Massoumeh Noori; Narges Gandomi; Fatemeh Atyabi; Mohammad Reza Fazeli; Hossein Jamalifar; and Rassoul Dinarvand. 2012. Improved antimycobacterial activity of rifampin using solid lipid nanoparticles International Nano Letters, 2:33.
