Teerthanker Mahaveer University
Teerthanker Mahaveer Medical College & Research Centre

M.Sc. Medical Microbiology

Programme Outcome

PO-1	**:**	Describe the pharmacokinetics and pharmacodynamics, indications, contraindications, interactions and adverse reactions of essential and commonly used drugs.
PO-2	**:**	Understand the concept of rational drug therapy in clinical pharmacology, the use of appropriate drug/ drugs in a particular disease with consideration of its/ their cost, efficacy and safety for individual needs and for mass therapy under national health programmes.
PO-3	**:**	Understand pharmacological basis of prescribing drugs in special medical situations such as pregnancy, lactation, infancy and old age.
PO-4	**:**	Prescribe drugs for common ailments and identify adverse drug reactions and their reporting.

Course Outcomes

M.Sc. Medical 1st Year

Course code	Course Title	Credit
MSC101	**Basics of Anatomy**	**7**

1. Understanding the basics of gross anatomy.
2. Understanding the biology of cells and tissues.
3. Analysing different types of Genetics and their applications
4. Able to show anatomical relation of various organs.
5. Able to answer genetic basis of various developmental anomalies.

Course code	Course Title	Credit
MSC102	**Basics of Physiology**	**6**

1. Understanding the working of internal organ and system.
2. Understanding the anatomy of different organs
3. Understanding the physiological functions of the biological systems
4. Application of functioning aspects of the human body at molecular level.

Course code	Course Title	Credit
MSC103	**Basics of Biochemistry**	**5**

1. Analysing the concepts of electrolytes and electrolytic dissociation, pH and its biological significance, buffers, Henderson-Hasselbalch equation, biological buffer systems and their importance.
2. Understanding the laws of thermodynamics, concepts of entropy, enthalpy and free energy changes and their application to biological systems and various biochemical studies and reactions.
3. Understanding the aerobic and anaerobic respiration and various intermediary mechanisms involved, oxidative phosphorylation

Course code	Course Title	Credit
MSC104	**Research Methodology**	**1**

1. Understanding the use and application of the methods of data collection and analysis.
2. Critically evaluating research methodology and findings.
3. Applying their role and others' roles as researchers.

Course code	Course Title	Credit
MSC151	**Basics of Anatomy (Lab)**	**3**

1. Understanding gross anatomy of entire body including upper limb, lower limb, thorax, abdomen, pelvis, perineum, head and neck, brain and spinal cord.
2. Understanding the normal disposition of gross structure and their interrelationship in the human body.
3. Analysing the integrated functions of organs systems and locate the site of gross lesions according to deficits encountered.
4. Analysing the process of gametogenesis, fertilization, implantation and placenta formation in early human embryonic development along with its variation and applied anatomy.

Course code	Course Title	Credit
MSC152	**Basics of Physiology**	**3**

1. Understanding all aspect of general and applied physiology and general principles of medical education.
2. Applying the basic physiological mechanisms of human body with reference to their implications in the pathophysiology of diseases, their diagnosis, treatment and management.
3. Conducting clinical and experimental research and interpret relevant findings.

Course code	Course Title	Credit
MSC153	**Basics of Biochemistry**	**2**

1. Understanding the concepts of electrolytes and electrolytic dissociation, pH and its biological significance, buffers, Henderson-Hasselbalch equation, biological buffer systems and their importance.
2. Understanding the laws of thermodynamics, concepts of entropy, enthalpy and free energy changes and their application to biological systems and various biochemical studies and reactions.
3. Understanding aerobic and anaerobic respiration and various intermediary mechanisms involved oxidative phosphorylation.

Course code	Course Title	Credit
MSM 201	**General bacteriology**	**5**

1. Understand Microbiology starting from history, Basic laboratory techniques and basic knowledge about the micro organisms.
2. Understand cell divisions, functions and microbial physiology and also biochemical properties of molecules.

3. Analyse relationship between disease andmicrobes, techniques used in infective samples processing.
4. Apply the relationship between the specific infection and microbes and techniques used in medical microbiology.

Course code	Course Title	Credit
MSM 202	**Systemic bacteriology**	**5**

1. Applying skills in microscopy and their handling techniques and staining procedures
2. Understand the basic microbial structure and function and study the comparative characteristics of prokaryotes and eukaryotes
3. Understand the structural similarities and differences among various physiological groups of bacteria.
4. Applying various culture media
5. Understand various physical and chemical means of sterilization
6. Understand general bacteriology and microbial techniques for isolation of pure cultures of bacteria, fungi. Master aseptic techniques
7. Perform routine culture handling tasks safely and effectively.

Course code	Course Title	Credit
MSM 251	**Microbiology practical I**	**12**

1. Analyse the various methods for identification of unknown microorganisms. Understand the microbial transport systems
2. Understand various Physical and Chemical growth requirements of bacteria and get equipped with various methods of bacterial growth measurement.

Course code	Course Title	Credit
MSM 301	**Virology, mycology, parasitology**	**5**

1. Understand the terminologies related to molecular biology and microbial
2. Understand the properties, structure and function of genes in living organisms at the molecular level
3. Analyse central dogma of gene action

Course code	Course Title	Credit
MSM 302	**Clinical microbiology, molecular biology & recent advances**	**5**

1. Understand DNA as a genetic material, enzymology, and replication strategies
2. Understand the molecular mechanisms involved in transcription and translation
3. Analysis of genetic code and wobble hypothesis

Course code	Course Title	Credit
MSM 201	**Microbiology practical II**	**12**

1. Understanding the molecular mechanisms underlying mutations, detection of mutations and DNA damage and repair Mechanisms.
2. Understand recombination, linkage mapping and elucidate the gene transfer mechanisms inprokaryotes and eukaryotes

3. Apply lab protocols involving molecular techniques

Teaching Methodology

Course code	Course Title	Credit
MSC 201	**Teaching Methodology**	**3**

1. Understand various teaching modalities.
2. Apply experiments related to the subject.
3. Apply skills required for teaching to undergraduate students.

Fundamental of Computer

Course code	Course Title	Credit
MSC 251	**Fundamental of Computer**	**1**

1. Apply computer programs/computer-based systems in the areas related to algorithms, networking, web design, cloud computing and data analytics of varying complexity.
2. Apply the contemporary trends in industrial/research settings and there by innovate novel solutions to existing problems.
3. Identify, analyze, and synthesize scholarly literature relating to the field of computer science.
4. Apply software development tools, software systems, and modern computing platforms.

Teaching practice

Course code	Course Title	Credit
MSC 351	**Teaching practice**	**3**

1. Understand teaching methods required for explaining the subject.
2. Build ability to communicate well to students
3. Apply practical skills required for demonstration/teaching.

Thesis

Course code	Course Title	Credit
MSA, MSF, MSB, MSM, MSP 352	**Thesis**	**12**

1. Develop deeper knowledge, understanding, capabilities and attitudes in the context of the programme of study.
2. Delve more deeply into and synthesise knowledge acquired in previous studies. A thesis for a Master of Science programmes should place emphasis on the technical/scientific/artistic aspects of the subject matter.
3. Display the knowledge and capability required for independent work as a Master of Science.
4. Plan and use adequate methods to conduct qualified tasks in given frameworks and to evaluate this work.
5. Contribute to research and development work