TEHRAN UNIVERSITY OF MEDICAL SCIENCES

# Bachler of Medicine, Bachler of Surgery (MBBS)

Core Curriculum and Essential training program

International Campus

Sept 2019 entries

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# TUMS

Tehran University of Medical Sciences
**Faculty of medicine**

# Tehran University of Medical Sciences
# TUMS

The history of the Tehran University of Medical Sciences goes back to the days of "Dar ul-Funun" School, being established In 1851 considering medicine as one of its modern educational pillars and main subjects.
The first group of graduates started practicing medicine in 1856. It finally separated from University of Tehran by parliamentary legislation in 1986, coming under the new Ministry of Health, Treatment, and Medical Education (MoH&ME).

Nowadays Tehran University of Medical Sciences is the largest (in terms of faculty staff, educational and therapeutic infrastructure) and most highly ranked medical university of Islamic republic of Iran. It was ranked the first among Iranian Medical Sciences Universities by the Ministry of Health for seven straight years.

National ranking
performed by National Ministry of Health and Medical Education (MoH&ME)

- 2017: National rank: 1

International Ranking of
Tehran University of Medical Sciences
in recent evaluations

| |
|---|
| **QS World University Rankings**<br>o 2017: International rank: 351-400<br>o |
| **Academic Ranking of World Universities (ARWU/Shanghai Ranking)**<br>o International rank : 501-600 |

# TUMS Mission

As a member of the national health system and in accordance with the general policies made by the Ministry of Health and Medical Education, TUMS renders services to the population covered and is active in the following areas:

1. Rendering educational services within the scope of health sciences to extend the university's expertise to the community locally, nationally, and internationally to support health promotion, health maintenance, and the advancement of the health sciences. This is accomplished to serve the community by dissemination of knowledge through teaching and discovery of knowledge through research, to emphasize offering specialized and

subspecialized courses, and Ph.D. programs for training manpower needed by other medical universities and health care and research centers.

2. Introducing healthcare-oriented science and technology through conducting fundamental, applied and developmental research for:

    - Solving health care problems at the regional and national levels,
    - Acquiring the technology for production of strategic medical and drug supplies to meet local needs and boost exports,
    - Designing and promoting new software, and educational methods appropriate for the needs of the society,
    - Providing for joint efforts with other organizations, institutions, and universities to identify and meet mutual needs, and render scientific and specialized services,
    - Developing appropriate structural and managerial models and procedures within the national health system,
    - Participating in publication of renowned scientific resources and contributing to the production of science at the national and international levels.

3. Rendering health care services
4. Supervising and inspecting health care centers and authorizing the issuance of license on health care services in the covered area on behalf of the concerned ministry.

# TUMS Vision

The gist of the vision of TUMS is summarized as accomplishing the following in the coming decade:

- Promoting the university's academic status at the regional as well as the international level through acquiring the required

capabilities in rendering higher educational services of the countries in the region,

- Increasing the university's role in production of science, research, and publication of scientific articles in the international journals, and meeting health needs of the society,

- Obtaining the required technology to produce the strategic medical supplies for the needs of the society,

- Improving health care standards of the covered population, and enhancing the quality and the diversity of the sub-specialized health care services,

- Playing effective roles in introducing new methods and comprehensive plans for environmental preservation.

The university has 11 schools, operates 16 teaching hospitals, is equipped with over 44 reference medical libraries, and publishes 58 journals, some in collaboration with academic societies.

Tehran University of Medical Sciences consists of the following schools:

- School of Medicine,
- School of Dentistry,
- School of Pharmacy,
- School of Public Health,
- School of Rehabilitation,
- School of Allied Medical Sciences,
- School of Nursing & Midwifery,
- School of Persian Medicine,
- School of Advanced Medical Technologies,
- School of Nutrition Sciences and Dietetics,
- Virtual School.

TUMS Institutes and Research Centers

Institutes:

- Endocrinology and Metabolism Research Institute (EMRI)
  - Endocrinology and Metabolism Clinical Sciences Research Institute:
  - Diabetes Research Centre
  - Osteoporosis Research Centre
  - Endocrinology and Metabolism Research Center
  - Endocrinology and Metabolism Molecular-Cellular Research Sciences:
  - Biosensor Research Centre
  - Metabolic Diseases Research Centre
  - Obesity and Eating Habit Research Centre
  - Endocrinology and Metabolism Population Sciences Research Institute:
  - Chronic Diseases Research Centre
  - Elderly Health research Center
  - Non-communicable Diseases Research Centre
- Institute for Environmental Research (IER)
  - Center for Water Quality Research (CWQR)
  - Center for Air Pollution Research (CAPR)
  - Center for Solid Waste Research (CSWR)
- Reducing High-risk Behaviors Research Institute (RHRBRI)
- Dentistry Sciences Research Institute (DSRI)
- Institute for Advanced Medical Technologies (IAMT)
- Family Health Research Institute (FHRI)
- Digestive Diseases Research Institute (DDRI)
- Pharmaceutical Sciences Research Institute (PSRI)
- Neurological Rehabilitation Research Institute (NRRI)

## TUMS Research Centers

- Brain and Spinal Injury Research Center (BASIR)
- Sports Medicine Research Center (SMRC)
- Rheumatology Research Center (RRC)
- Immunology, Asthma and Allergy Research Center (IAARC)
- Sina Trauma and Surgery Research Center (STSRC)
- Psychiatry and Psychology Research Center (PPRC)
- Medical Ethics and History of Medicine Research Center (MEHMRC)
- Nursing and Midwifery Care Research Center(NMCRC)
- Research Center for Nuclear Medicine (RCNM)
- Urology Research Center (URC)
- Knowledge Utilization Research Center (KURC)
- Uro-Oncology Research Center (UORC)
- Research Center for Immunodeficiencies (RCID)
- Molecular Immunology Research Center (MIRC)
- Research Center of Quran, Hadith and Medicine (RCQHM)
- Medicinal Plants Research Center (MPRC)
- Toxicology and Poisoning Research Centre (TPRC)
- Nanotechnology Research Center (NRC)
- Center for Academic and Health Policy (CAHP)
- Pediatric Urology Research center (PURC)
- Advanced Diagnostic and Interventional Radiology Research Center (ADIRRC)
- Center for Educational Research in Medical Sciences (CERMS)
- Center for Research and Training in Skin Diseases and Leprosy (CRTSDL)
- Eye Research Center (ERC)
- Hematology, Oncology and Stem Cell Transplantation Research Center (HORCSCT)
- Iranian Tissue Bank (ITB) Research & Preparation Center
- Otorhinolaryngology Research Center (ORC)
- Skin and Stem Cell Research Center (SSCRC)
- Cancer Research Center, Cancer Institute of IR.Iran (CRC)
- Research Center for Rational Use of Drugs (RCRUD)
- Research Center for Immunodeficiencies (RCID)
- Breast Disease Research Center (BDRC)
- Thrombosis Hemostasis Research Center (THRC)
- Craniomaxillofacial Research Center (CMFRC)

In medical education domain, in order to acquire deep practical knowledge and skills, one of the most important aspects is the hands-on experience and practical training as an effective member of experienced care team; from which the medical students benefit the most.

Regarding this necessity, TUMS has a huge advantage in comparison with many other similar universities, as it has **16 teaching (Educational and Therapeutic) Hospitals** which cover a population of more than **3,000,000 people directly** and a **nationwide referral for more than 80 million** Iranian Population; providing TUMS students with ample and valuable opportunities to put their knowledge to practice in the field.

Tehran University of Medical Sciences affiliated Hospitals

4654 total number of teaching hospital active beds affiliated to TUMS in 16 Hospitals

dedicated to rotations and educational purposes of TUMS students in all fields of Health sciences, including undergraduate Doctor of Medicine curriculum medical students.

| | Hospital Name | Activity Type | Care Type | Founding Year | Hospital Bed Occupancy Rate % (annual mean) | Number of Hospital Active Beds |
|---|---|---|---|---|---|---|
| | | | | | | |
| 1 | **Sina Hospital Complex** | Teaching & research* Hospital | General (specialty & subspecialty) | 1837 | 86.63 | **459** |
| 2 | **AmirA'lam Hospital Complex** | Teaching & research* Hospital | General *Otorhinolaryngology | 1913 | 72.31 | **227** |
| 3 | **Children's Medical Center Hospital** | Teaching Hospital | Pediatrics referral Center | 1968 | 94.68 | **348** |
| 4 | **Imam Khomeini Hospital Complex** | Teaching Hospital | General (specialty & subspecialty) | 1938 | 89.61 | **1104** |
| 5 | **VALI-E-ASR HOSPITAL** | Teaching Hospital | General (specialty & subspecialty) | 1975 | | |
| 6 | **CANCER INSTITUTE** | Teaching Hospital | Cancer referral center | 1949 | | |
| 7 | **Baharloo Hospital** | Teaching Hospital | General | 1940 | 85.47 | **294** |
| 8 | **Bahrami Children's Hospital** | Teaching Hospital | Pediatrics | 1955 | 76.66 | **131** |

| | Hospital Name | Activity Type | Care Type | Founding Year | Hospital Bed Occupancy Rate % (annual mean) | Number of Hospital Active Beds |
|---|---|---|---|---|---|---|
| 9 | **Dr Shariati Hospital** | Teaching & research* Hospital | General (specialty & subspecialty) | 1965 | 86.45 | **518** |
| 10 | **Razi Hospital** | Teaching & research* Hospital | Dermatology | 1934 | 51.41 | **69** |
| 11 | **Roozbeh Hospital** | Teaching & research* Hospital | Psychiatry and neurology | 1951 | 98.24 | **207** |
| 12 | **Ziaeian Hospital** | Teaching Hospital | General | 1989 | 82.28 | **144** |
| 13 | **Farabi Eye Hospital** | Teaching & research* Hospital | Ophthalmology | 1930 | 85.79 | **221** |
| 14 | **Arash Women's Hospital** | Teaching Hospital | Obstetrics & Gynecology | 1975 | 98.48 | **140** |
| 15 | **Tehran Heart Center** | Teaching & research* Hospital | Cardio Vascular Diseases | 2001 | 83.85 | **452** |
| 16 | **Yas Hospital** | Teaching Hospital | General *Obstetrics and Gynecology | 1918 | 70.5 | **250** |
| | | | | | *total number of teaching hospital active beds* | **4564** |

# Education development center (EDC)

"Education development center (EDC) of Tehran University of Medical Sciences (TUMS)" was established in 1995 to enhance the quality of medical education through policymaking, planning, evaluation, and monitoring, and (in necessary cases) educational development activities at the faculty and university level.

For decades TUMS has had gained a reputation for medical educational excellence and is known for being demanding by its intensive and inclusive curricula, restrict education/evaluation standards, and top-ranked skilled faculty members. And still today, TUMS holds the role of being an exemplar nationally and internationally in the Region.

Since its establishment, for more than two decades, the education development center of TUMS is focused on its mission of "improving the quality of education and learning with the aim of training educated workforce for giving the highest quality health services to the public and patients", through perpetual-ongoing reforms in curriculum and educational empowerment of faculty members and professors.

Tehran University of Medical Sciences and the "association of medical education in Europe" (AMEE) currently hold an active Collaboration agreement.

Based on the which, representatives of Tehran University of medical sciences are members of the BEME board and BEME review editorial committee (BREC) and actively collaborate and share success stories in the enhancement and educational optimization.

The EDC of TUMS believes that all educational environments at the university level, are the arena for the development of medical education. Therefore, we consider all faculty members, medical students, administrative staff, and TUMS graduates as colleagues to achieve our vision.

# TUMS Doctor of Medicine –
# Bachler of Medicine, Bachler of Surgery Course

specifications
timeline
stages
and core Syllabus topics

# General specifications of the course

Course Name: **Bachler of Medicine, Bachler of Surgery - MBBS**

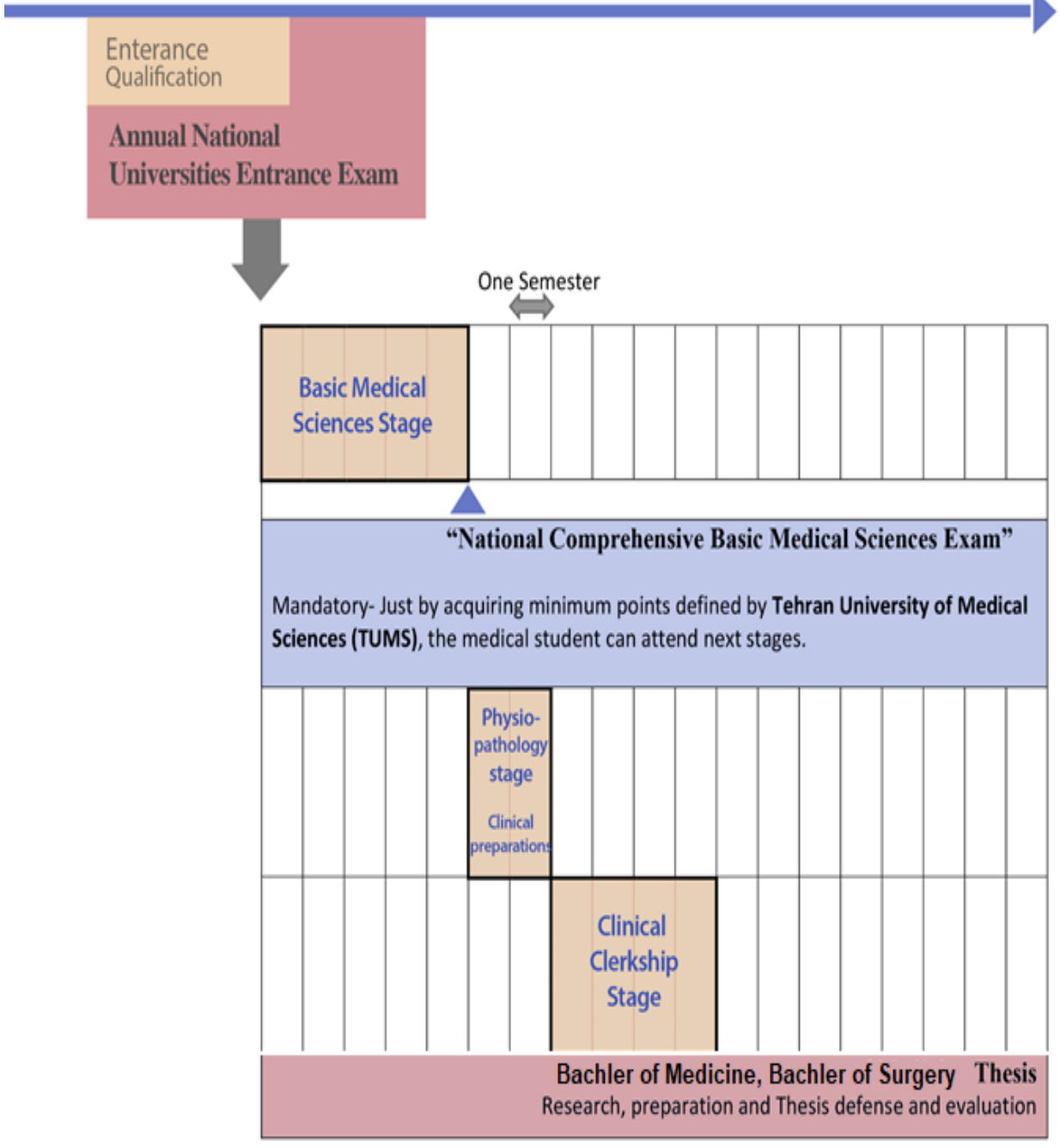
Course length: The minimum mandatory course length is 5.5 years.

The form of the system and its regulations are based on the educational regulations of the general medical doctorate (undergraduate) course approved by the National High Council for Planning of health and Medical Sciences.

The general medicine training course by this Curriculum includes 3 main stages:

1. Basic Medical Sciences
2. Clinical preparations (Physiopathology stage)
3. Clinical Clerkship

## Tehran University of Medical Sciences
## Bachler of Medicine, Bachler of Surgery Course Timeline




* Note: Time spans depicted above are core mandatory and minimum mandatory time spans. By elective and optional courses mentioned in the curriculum it can differ per student.

Total credits of the course: The total core quantity of credits in this course is 220.72 which is distributed as follows: .

- Basic Medical Sciences Phase: 82.62 (for International Students)
- Fundamental of Clinical Medicine phase: 35.6
- Clinical Clerkship Phase: 102.5

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Total 220.72 credits

## — Compulsory core courses:

Compulsory courses include curriculum core contents that is mandatory for all general medical students to achieve the expected competencies of general practitioners.

Tehran university of medical sciences Faculty of Medicine and its affiliated Hospitals will provide the required conditions that ensures achieving the Objectives and goals stated in this document.

Compulsory core courses will be presented in all the four stages of the general medicine as follows:

## 1) The first stage
## **Basic Medical Sciences:**

General courses: At least 16 credits out of 18 required credits before the comprehensive exam of basic medical sciences

Basic courses: At least 65.12 credits out of 82.62 required basic medical sciences credits before the comprehensive basic medical sciences exam..

- After the fourth semester and passing certain courses or at the end of Basic Medical Science (fifth semester) students can be eligible to attend comprehensive exam.
- Entry to the second stage (clinical preparation stage) is subject to obtaining a passing score in the **"National comprehensive basic sciences exam"**.

## 2) Second stage
## **Clinical preparations**
## **(Physiopathology stage):**

Number of dedicated credits in the clinical preparation phase: 35.6 credits

3) The third stage

**Clinical Clerkship:**

The minimum length of the Clinical Clerkship stage is **23 months**,

Those students who enter Clerkship Phase, during 23 consecutive months, they pass all Hospital Wards and theoretical courses, which is a total of 96.5 Credits. Each month in Clerkship Ward is 3 Credits.
This Phase include 31 theoretical courses & Hospital Wards.

Number of specific theoretical credits of the Clinical Clerkship stage (mandatory): 32 credits

Number of Practical Clinical Clerkship credits (mandatory) 64.5 credits

Thesis 6.0 credits

- A student graduating from a medical course in order to become "**Bachler of Medicine, Bachler of Surgery - MBBS**", is subject to propose a thesis research topic based on priorities and university protocols, register it, perform the research and as final step of becoming **Bachler of Medicine, Bachler of Surgery - MBBS**, present and successfully defend his Thesis.

# Course Topics

| | Subject | Number of credits | | | |
|---|---|---|---|---|---|
| | | Credit (theory) | Credit (practical Clerkship) | prerequisite | |
| 1 | Tissue, Development & Function | 2.18 | 0.24 | | 2.42 |
| 2 | Cell and Molecules | 2.65 | 0.44 | | 3.09 |
| 3 | Anatomy of limbs | 1.5 | 1.5 | | 3.00 |
| 4 | Medical Physics | 2.0 | | | 2.00 |
| 5 | Principles of Health Services | 1.5 | | | 1.50 |
| 6 | General English Language | 3.0 | | | 3.00 |
| 7 | Cardiovascular System | 2.76 | 0.7 | | 3.46 |
| 8 | Respiratory System | 1.06 | 0.3 | | 1.36 |
| 9 | Medical Genetic | 2.0 | | | 2.00 |
| 10 | Biochemistry | 1.5 | 0.5 | Cell and Molecules | 2.00 |
| 11 | Psychology | 2.0 | | | 2.00 |
| 12 | Family Health | 2.0 | | Passing score is12.00 out of 20.00 | 2.00 |
| 13 | Persian Language | 3.0 | | | 3.00 |
| 14 | Medical Terminology I | 3.0 | | General English Language | 3.00 |
| 15 | Gastrointestinal System | 2.12 | 0.62 | | 2.74 |
| 16 | Endocrine Systems | 1.65 | 0.22 | | 1.87 |
| 17 | Urinary System | 1.65 | 0.25 | | 1.90 |
| 18 | Reproductive System | 1.24 | 0.18 | | 1.42 |
| 19 | Nutrition | 2.0 | | | 2.00 |
| 20 | Principles of Epidemiology | 2.0 | | Principles of Health Services | 2.00 |
| 21 | Information Technology | 2.0 | | | 2.00 |
| 22 | Physical Training I | 1.0 | | | 1.00 |
| 23 | Devine Ethics | 2.0 | | | 2.00 |
| 24 | Introduction to religion I | 2.0 | | | 2.00 |
| 25 | Immunology | 1.8 | 0.2 | | 2.00 |

| | | | | | |
|---|---|---|---|---|---|
| 26 | *Nervous System* | *2.76* | *0.35* | | *3.11* |
| 27 | *Special Senses* | *0.88* | *0.17* | | *1.05* |
| 28 | *Anatomy of Head and Neck* | *1.2* | *0.5* | | *1.70* |
| 29 | *Microbiology* | *2.4* | *0.6* | | *3.00* |
| 30 | *Virology* | *1.0* | | | *1.00* |
| 31 | *Medical Terminology II* | *3.0* | | *Medical Terminology I* | *3.00* |
| 32 | *Physical Training II* | *1.0* | | *Physical Training I* | *1.00* |
| 33 | *Introduction to religion II* | *2.0* | | | *2.00* |
| 34 | *Pathology* | *3.0* | *1.0* | | *4.00* |
| 35 | *Parasitology* | *2.0* | *1.0* | | *3.00* |
| 36 | *Mycology* | *1.0* | | | *1.00* |
| 37 | *Devine Texts* | *2.0* | | | *2.00* |
| 38 | *Iran Revolution* | *2.0* | | | *2.00* |
| 39 | *Advanced Pathology 1* | *2.0* | | | *2.00* |
| 40 | *Advanced Pathology 2* | *2.0* | *0.7* | | *2.70* |
| 41 | *Basic Clinical Skills* | *2.0* | *2.0* | | *4.00* |
| 42 | *Clinical Immunology 1* | *1.0* | | | *1.00* |
| 43 | *Clinical Immunology 2* | *1.0* | | | *1.00* |
| 44 | *Fundamentals of Clinical Infectology* | *1.0* | | | *1.00* |
| 45 | *Fundamentals of Clinical Neurology* | *0.5* | | | *0.50* |
| 46 | *Fundamentals of Clinical Pediatrics* | *1.0* | | | *1.00* |
| 47 | *Fundamentals of Clinical Psychiatry* | *0.5* | | | *0.50* |
| 48 | *Fundamentals of Clinical Surgery* | *1.0* | | | *1.00* |
| 49 | *Medical Rituals* | *1.0* | *0.5* | | *1.5* |
| 50 | *Pathophysiology of Cardiology* | *2.0* | | | *2.00* |
| 51 | *Pathophysiology of Endocrinology* | *2.0* | | | *2.00* |
| 52 | *Pathophysiology of Gastroenterology* | *1.88* | | | *1.88* |
| 53 | *Pathophysiology of Hematology* | *2.0* | | | *2.00* |
| 54 | *Pathophysiology of Nephrology* | *1.76* | | | *1.76* |
| 55 | *Pathophysiology of Pulmonology* | *2.0* | | | *2.00* |





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| | | | | | |
|---|---|---|---|---|---|
| 56 | *Pathophysiology of Rheumatology* | *1.76* | | | *1.76* |
| 57 | *Pharmacology 1* | *2.0* | | | *2.00* |
| 58 | *Pharmacology 2* | *2.0* | | | *2.00* |
| 59 | *Medical Statistics* | *1.0* | | | *1.0* |
| 60 | *Anesthesiology Clerkship* | | *1.5* | | *1.5* |
| 61 | *Clinical Epidemiology* | *2.0* | | | *2.0* |
| 62 | *Dermatology* | | *3.0* | | *3.0* |
| 63 | *Elective* | | *1.5* | | *1.5* |
| 64 | *Emergency Medicine* | | *1.5* | | *1.5* |
| 65 | *Forensic Medicine & Toxicology* | *2.0* | | | *2.0* |
| 66 | *General Surgery* | *5.0* | *6.0* | | *11.0* |
| 67 | *ICT & Research Methodology* | *2.0* | | | *2.0* |
| 68 | *Infectology* | *2.0* | *3.0* | | *5.0* |
| 69 | *Internal Medicine* | | *12.0* | | *12.0* |
| 70 | *Medical Ethics* | *2.0* | | | *2* |
| 71 | *Neurology* | *1.5* | *3.0* | | *.5* |
| 72 | *Neurosurgery* | *1.0* | | | *.0* |
| 73 | *Obstetrics & Gynecology* | *4.0* | *6.0* | | *.0* |
| 74 | *Ophthalmology* | | *1.5* | | *1.5* |
| 75 | *Orthopedics* | *2.0* | *3.0* | | *5.0* |
| 76 | *Otorhinolaryngology* | | *3.0* | | *3.0* |
| 77 | *Pediatric Disease* | *4.0* | *9.0* | | *13.0* |
| 78 | *Pediatric Diseases 2* | *1.0* | | | *1.0* |
| 79 | *Public Health* | | *2.0* | | *2.0* |
| 80 | *Psychiatry* | *1.5* | *3.0* | | *4.5* |
| 81 | *Radiology* | | *3.0* | | *3.0* |
| 82 | *Traditional Medicine* | *2.0* | | | *2.0* |
| 83 | *Urology* | *1.0* | *3.0* | | *4.0* |
| 84 | *Thesis* | | *6.0* | | *6.0* |





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The first stage

# Basic Medical Sciences

Core Syllabus

**COURSE NAME**: Cell and Molecules Block

**NUMBER OF CREDITS:** 2.65 (theory) – 0.44 (practical)

**COURSE TYPE:** Theoretical and Practical

**GENERAL AIMS and DESCRIPTION:**

This is the first block of MBBS program in Tehran University of Medical Sciences. The Cellular and Molecular Biology Program fosters interactions among students and faculty, helping to broaden the students' appreciation of diverse research opportunities and to encourage interdisciplinary thinking in a highly collaborative atmosphere. This program has been an integrative force that aims to tie together the various disciplines of genetics, biochemistry, microbiology, immunology, cell biology and others. The goal is to train our students to examine scientific problems from many perspectives through individualized, flexible programs of coursework and research. The biochemical pathways of living organisms are studied with a focus on metabolic processes. Topics include pathways linking nutritional intake and energy yielding processes as well as the application of underlying. Broad content includes a study of the chemistry and reactions of constituents of living matter, including carbohydrates, lipids, proteins, nucleic acids, vitamins, coenzymes, and minerals. In addition, the chemistry and regulation of the reactions and processes of whole organisms will be examined including: endocrinology, enzymology, nutrition, intermediary metabolism and biochemical mechanisms involved in select disease states.

***References***


1. **Junqueira's Basic Histology**. McGraw-Hill Medical 2010; 12th edition, chapters 1, 2, 3
2. **Guyton and Hall Textbook of Medical Physiology**. Saunders 2011, 12th edition, chapters 4 & 5
3. Cohen B.J. **Medical terminology: an illustrated guide.** Walter Kluwer/Lippincott Williams & Wilkins 2008. 5th edition
4. Devlin T.M. **Textbook of Biochemistry with Clinical Correlation**. John Wiley & Sons 2010; 7th edition
5. Murray R. Et al. **Harpers Illustrated Biochemistry**. McGraw-Hill Medical 2009; 28th edition
6. **Ganong's Review of Medical Physiology**. McGraw-Hill Medical 2009; 23rd edition

***Cell and Molecules (theory) subjects***

| *Session Title* | *Hrs.* |
|---|---|
| *Introduction to Cell & Molecule* | **2** |
| *Water and buffer* | **2** |
| *Introduction to Histology* | **2** |
| *Cell* | **4** |
| *Amino acid Structure & Classification* | **2** |
| *Amino acids & proteins classification* | **2** |
| *Amino acids & proteins functions* | **2** |
| *Amino acids & proteins Hemoglobin* | **2** |
| *Carbohydrates Mono- & Di- Saccharides* | **2** |
| *Carbohydrates Glycoconjugates* | **2** |
| *Lipids & Lipoproteins Structure* | **4** |
| *Enzymes* | **6** |
| *Vitamins & Coenzymes* | **2** |
| *Water Soluble Vitamins* | **2** |
| *Fat soluble vitamins* | **2** |
| *Amino Acids Structure* | **2** |
| *DNA Replication* | **2** |
| *Molecular biology Transcription* | **2** |
| *Molecular biology Translation* | **2** |
| *Molecular biology Repair mechanisms* | **2** |
| *Molecular biology Regulation of gene expression* | **2** |
| *Membrane performances* | **4** |
| *Membrane Potential (Voltage)* | **4** |
| *Total hrs.* | **58** |

***Cell and Molecules (practical) subjects***

| *Session Title* | *Hrs.* |
|---|---|
| *Titration* | **2** |
| *Carbohydrates* | **2** |
| *AminoAcides* | **2** |
| *Enzymes* | **2** |
| *Spectrophotometer* | **2** |
| *DNA Extraction* | **2** |
| *Chromatography* | **2** |
| *FlamePhotometery* | **2** |
| *Osmose* | **2** |
| *Total hrs.* | **18** |

**COURSE NAME**: Tissue, Development & Function Block
**NUMBER OF CREDITS:** 2.18 (theory) – 0.24 (practical)
**COURSE TYPE:** Theoretical and Practical

**GENERAL AIMS and DESCRIPTION:**

This is a lecture and laboratory course that examines the microanatomy of cells, tissues and organs. Lectures illustrate the microstructure of major tissues and organs in relation to their function. Laboratory exercises use the light microscope to study these components and make use of slides and electron micrographs for review and discussion. This lab-oriented program presents the molecular biology and histology of normal cells, tissues and organ systems at various developmental functional stages. Students learn how individual cell functions interact with one another and how such interactions are accomplished from the tissue levels to the organ levels. The course introduces molecular and control systems and prepares students for an understanding of normal (homeostasis) systems and pathological conditions. In addition, students learn how molecular building blocks are utilized for growth and differentiation, wound healing and tissue repair, defence mechanisms and transfer of hereditary characters.

***References***


1. **Junqueira's Basic Histology**. McGraw-Hill Medical 2010; 12th edition; chapters 4-10 and 12-13 and 18
2. **Langman's Medical Embryology**. Lippincott Williams & Wilkins 2012, 12th edition; chapters 2-9, pages 10-129
3. **Guyton and Hall Textbook of Medical Physiology**. Saunders 2011, 12th edition, chapters 6, 7, 8
4. **Ganong's Review of Medical Physiology**. McGraw-Hill Medical 2009; 23rd edition

***Tissue, Development & Function (theory) subjects***

| *Session Title* | *Hrs.* |
|---|---|
| *Epithelial Tissue* | 2 |
| *Connective Tissue* | 2 |
| *Types of Connective & Adipose Tissue* | 2 |
| *Cartilage Tissue & Joints* | 2 |
| *Osseous Tissue & Ossification* | 2 |
| *Blood & Hematopoiesis* | 2 |
| *Muscular Tissue* | 2 |
| *Nervous Tissue* | 4 |
| *Definition for Neurotransmission& Neurotransmitters* | 2 |
| *Cell Signaling* | 2 |
| *Skin* | 2 |
| *Introduction to Embryology* | 2 |
| *Gametogenesis* | 2 |
| *Ovulation & Fertilization* | 2 |
| *Embryonic Period* | 2 |
| *1st & 2nd Weeks of Embryonic Period* | 2 |
| *3rd Weeks of Embryonic Period* | 2 |
| *Fetal Period* | 2 |
| *Placenta & Fetal Membranes* | 2 |
| *Congenital Malformations* | 2 |
| *Contraction of Skeletal Muscle* | 2 |
| *Excitation of Skeletal Muscle* | 2 |
| *Contraction of Smooth Muscle* | 2 |
| *Neuromuscular Transmission* | 2 |
| *Total hrs.* | 50 |

***Tissue, Development & Function (practical) subjects***

| *Session Title* | *Hrs.* |
|---|---|
| *Microscopes* | 2 |
| *Epithelial Tissue* | 2 |
| *Connective & Osseous Tissue* | 2 |
| *Blood smears and cell differentiation* | 2 |
| *Cartilage Tissue* | 2 |
| *Muscular Tissue* | 2 |
| *Nervous Tissue* | 2 |
| *Skin* | 2 |
| *Total hrs.* | 16 |

**COURSE NAME**: Cardiovascular System Block
**NUMBER OF CREDITS:** 2.76 (theory) – 0.7 (practical)
**COURSE TYPE:** Theoretical and Practical

## GENERAL AIMS and DESCRIPTION:

This course provides instruction into the mechanisms of operation of the human cardiovascular system. Emphasis is placed on the integration of relevant principles from anatomy, physiology, biochemistry, pathology, pharmacology and microbiology with respect to the behavior of the normal circulation and its responses to the stress of injury and disease. Both expert-directed and student-directed methodologies will be employed in this module and a select set of clinical cases will be used to guide instruction. Circulatory systems will present students with an integrated approach to the key supply chain and waste management systems of the body. Students will follow the movement of oxygen from the environment to the tissues, and movement of waste products of metabolism along the opposite path, examining the coordinated roles of the lungs, heart and kidney in the control and regulation of these processes. Introduction to anatomy, histology and pharmacology content will be incorporated into the course.

***References***


1. Drake R.L. **Gray's Anatomy for Students**. Churchill Livingstone 2010; 2nd edition. pp 58-243 excluding: 101-106, 128-130, 137-139, 159-176
2. **Junqueira's Basic Histology**. McGraw-Hill Medical 2010; 12th edition. Chapters 11 & 14
3. **Langman's Medical Embryology**. Lippincott Williams & Wilkins 2012; 12th edition. Chapter 13, pp: 162- 201.
4. **Medical physiology, Guyton and hall**. Saunders 2011, 12th edition. Chapters 9-12, Chapters 14-19, Chapter 20 (exception: methods for measuring cardiac output up to end) Chapter 21 (exception: ischemic heart disease up to end) Chapter 23Chapter 23 وChapter 23
5. Snell R.S. **Clinical Anatomy by Systems**. Lippincott Williams & Wilkins 2006 ,Chapters 4 and 5 Pages 94-95 Page 271 (Thoracic duct) Page 609 (Phrenic nerve) Pages 569-571 (Vagus nerve)
6. Snell R.S. **Clinical Anatomy by Regions** 2008; 8th edition.
7. **Ganong's Review of Medical Physiology**. McGraw-Hill Medical 2010; 23rd edition. Chapters 5, 30-34
8. **Berne & Levy**. Medical physiology. 2008. 8th edition. Chapters 15-19


***Cardiovascular System (theory) subjects***

| *Session Title* | *Hrs.* |
|---|---|
| ***Vertebral Column, Ribs & Sternum*** | **2** |
| ***Back*** | **2** |
| ***Thoracic Wall*** | **2** |
| ***Mediastinum & Heart*** | **2** |
| ***Heart*** | **2** |
| ***Superior & Posterior Mediastinum*** | **4** |
| ***Overview of Cardiovascular system*** | **2** |
| ***Histology of Circulatory System*** | **2** |
| ***Histology of Lymphatic& Immune System*** | **4** |
| ***Embryology of the Heart*** | **2** |
| ***Embryology of Vessels*** | **2** |
| ***Physiology of RBCs /WBCs and Plts*** | **6** |
| ***Action Potentials in Cardiac Muscle, Cardiac Cycle*** | **2** |

| | |
|---|---|
| ***Electrocardiogram*** | **2** |
| ***Blood Pressure, Heart Sounds*** | **2** |
| ***"Volume-Pressure Diagram" During the Cardiac Cycle*** | **2** |
| ***Physics Principles of Circulatory System*** | **4** |
| ***Control of Excitation and Conduction in the Heart*** | **2** |
| ***of Circulatory System*** | **2** |
| ***Vessels of Circulatory System*** | **2** |
| ***Circulatory System of Lymph & Capillaries*** | **2** |
| ***Central Cardiovascular Control*** | **2** |
| ***Special Circulatory*** | **2** |
| ***Total hrs.*** | **56** |

***Cardiovascular System (practical) subjects***

| ***Session Title*** | ***Hrs.*** |
|---|---|
| ***Histology of Heart, Lymph & Capillaries Arteries*** | **4** |
| ***Cell blood Count (RBC/WBC)*** | **4** |
| ***Hematocrits and Coagulation tests*** | **2** |
| ***Electrocardiogram*** | **2** |
| ***Blood Pressure, Heart Sounds*** | **2** |
| ***Osteology*** | **4** |
| ***Anatomy of Back*** | **4** |
| ***Thoracic Wall*** | **2** |
| ***Mediastinum & Heart*** | **4** |
| ***Superior & Posterior Mediastinum*** | **2** |
| ***Total hrs.*** | **30** |

**COURSE NAME**: Respiratory System Block
**NUMBER OF CREDITS:** 1.06 (theory) – 0.3 (practical)
**COURSE TYPE:** Theoretical and Practical

## GENERAL AIMS and DESCRIPTION:

This block integrates the basic sciences into a study of the pulmonary system in both health and disease. Each of the basic science topics is incorporated into an integrated body of knowledge utilizing both didactic and self-directed learning methods, and clinical models.

***References***


1. **Drake** R.L. **Gray's Anatomy for Students**. Churchill Livingstone 2010; 2nd edition. pages 159-175 985-1029
2. **Junqueira's Basic Histology**. McGraw-Hill Medical 2010; 12th edition, pages 298-315
3. **Langman's Medical Embryology**. Lippincott Williams & Wilkins 2012, 12th edition. 201-2071
4. **Guyton and Hall Medical physiology,** 12th edition, 2011, chapters 37-41.
5. **Ganong's Review of medical physiology**, 2010, 23rd edition, section VII, chapters 35-37.
6. **Berne & Levy physiology**, 2010, 6th edition, section 5, chapters 20-25
7. Snell R.S. **Clinical Anatomy by Systems**. Lippincott Williams & Wilkins 2006
8. Snell R.S. **Clinical Anatomy by Regions** 2008; 8th edition


***Respiratory System (theory) subjects***

| *Session Title* | *Hrs.* |
|---|---|
| *Nasal Cavity* | **2** |
| *Pharynx & Larynx* | **2** |
| *Lung & Pleura* | **2** |
| *Histology of Respiratory System* | **2** |
| *Pulmonary Ventilation* | **2** |
| *Embryology of Respiratory System* | **2** |
| *Pulmonary Volumes and Capacities* | **2** |
| *Pulmonary circulation* | **2** |
| *Physical Principles of Gas Exchange* | **2** |
| *Transport of O2 and CO2 in Blood and Tissue Fluids* | **2** |
| *Regulation of Respiration* | **2** |
| *Total hrs.* | **22** |

***Respiratory System (practical) subjects***

| *Session Title* | *Hrs.* |
|---|---|
| *Histology of Respiratory system* | **2** |
| *Spirometery* | **2** |
| *Nasal Cavity, Pharynx & Larynx* | **2** |
| *Lung & Pleura* | **2** |
| *Applied Anatomy* | **2** |
| *Total hrs.* | **10** |

**COURSE NAME:** Anatomy of upper & Lower Limbs
**NUMBER OF CREDITS:** 1.5 (theory) – 1.5 (practical)
**COURSE TYPE:** Theoretical and Practical

## GENERAL AIMS

Anatomy of the Limbs explores the principles of biomechanics: specifically levers, torques, force vectors and center of gravity, as related to the human body. The unit explores, in detail, the functional anatomy of the upper and lower limb and their associated girdles. Applications of anatomical and biomechanical principles in analysis of upper and lower limb function and dysfunction will also be covered.

this course will teach you what we know about anatomy of different parts of human body and how it relates to development, various injuries and disorders; you'll get a chance to work with prosected human cadaveric specimens and medical images such as MRI scans; course will increase your practical skills, improve your problem-solving and image interpretation skills, and help you understand why fundamental anatomy and imaging are important to understanding human health & disease; this course will focus on the anatomy of the back, upper & lower limbs, thorax and abdomen;

***References***


1. **Junqueira's Basic Histology**. McGraw-Hill Medical 2010; 12th edition; chapters 4-10 and 12-13 & 18
2. **Langman's Medical Embryology**. Lippincott Williams & Wilkins 2012, 12th edition; chapters 2-9, pages 10-129
3. Snell R.S. **Clinical Anatomy by Systems**. Lippincott Williams & Wilkins 2006
4. Snell R.S. **Clinical Anatomy by Regions** 2008; 8th edition
5. Drake R.L. **Gray's Anatomy for Students**. Churchill Livingstone 2010; 2nd edition. Chapter 1, pages 4-53, Chapter 7, pages 650-791, Chapter 6, pages 512-647

***Anatomy of Limbs (theory) subjects***

| *Session Title* | *Hrs.* |
|---|---|
| *Introduction to Anatomical Sciences* | **2** |
| *Osteology of Upper limb* | **4** |
| *Shoulder Region* | **2** |
| *Axillary Cavity & Ant. Compartment of Arm* | **2** |
| *Post. Compartment of Arm & Cubital Fossa* | **2** |
| *Forearm* | **2** |
| *Hand* | **2** |
| *Joints, Clinical & Surface Anatomy Of Upper Limb* | **2** |
| *Osteology of Lower Limb* | **2** |
| *Ant.& Med. Compartments of Thigh* | **2** |
| *Luteal Region & Post. Compartment of Thigh* | **2** |
| *Popliteal Fossa & Post. Compartment of Calf* | **2** |
| *Foot* | **2** |
| *Ant. & Lat. Compartment of Calf* | **2** |
| *Joints, Clinical & Surface Anatomy of Lower Limb* | **2** |
| *Total hrs.* | *30* |

***Anatomy of Limbs (practical) subjects***

| *Session Title* | *Hrs.* |
|---|---|
| *Intro. to dissection ethics & professionalism* | **2** |
| *Osteology of Upper limb* | **2** |
| *Axilla wall* | **2** |
| *The contents of axilla and the anterior arm* | **2** |
| *Triceps and cubital* | **2** |
| *The anterior compartment of the forearm* | **2** |
| *Posterior compartment of the forearm and dorsum of the hand* | **2** |
| *Palm* | **2** |
| *Surface Anatomy and clinical and joints* | **2** |
| *Ant.& Med. Compartments of Thig* | **2** |
| *Gluteal and thigh* | **2** |
| *Popliteal and posterior tibia* | **2** |
| *Anterior and outside leg and back foot* | **2** |
| *Metatarsus* | **2** |
| *Total hrs.* | *28* |

**COURSE NAME:** Clinical Biochemistry
**NUMBER OF CREDITS:** 1.5 (theory) – 0.5 (practical)
**COURSE TYPE:** Theoretical and Practical

**GENERAL AIMS and DESCRIPTION:**

Topics include pathways linking nutritional intake and energy yielding processes as well as the application of underlying. Broad content includes a study of the chemistry and reactions of constituents of living matter, the chemistry and regulation of the reactions and processes of whole organisms will be examined including: endocrinology, enzymology, nutrition, intermediary metabolism and biochemical mechanisms involved in select disease states.

***References***


1. **Junqueira's Basic Histology**. McGraw-Hill Medical 2010; 12th edition, chapters 1, 2, 3
2. **Guyton and Hall Textbook of Medical Physiology**. Saunders 2011, 12th edition, chapters 4 & 5
3. Cohen B.J. **Medical terminology: an illustrated guide.** Walter Kluwer/Lippincott Williams & Wilkins 2008. 5th edition
4. Devlin T.M. **Textbook of Biochemistry with Clinical Correlation**. John Wiley & Sons 2010; 7th edition
5. Murray R. et al. **Harpers Illustrated Biochemistry**. McGraw-Hill Medical 2009; 28th edition
6. **Ganong's Review of Medical Physiology**. McGraw-Hill Medical 2009; 23rd edition


***Clinical Biochemistry (theory) subjects***

| *Session Title* | *Hrs.* |
|---|---|
| *Metabolism of carbohydrates* | 6 |
| *Metabolism of amino acids & other nitrogen compounds* | 4 |
| *Metabolism of non-protein nitrogen compounds* | 4 |
| *Clinical Enzymology* | 2 |
| *Metabolism of lipids & lipoproteins* | 6 |
| *Oxidative phosphorylation* | *2* |
| *Total hrs.* | 24 |

***Clinical Biochemistry (practical) subjects***

| *Session Title* | *Hrs.* |
|---|---|
| *Titration* | 2 |
| *Carbohydrates* | 2 |
| *AminoAcides* | 2 |
| *Enzymes* | 2 |
| *Spectrophotometer* | 2 |
| *DNA Extraction* | 2 |
| *Chromatography* | 2 |
| *FlamePhotometery* | 2 |
| *Osmose* | 2 |
| *Total hrs.* | 18 |

**COURSE NAME:** Gastrointestinal System Block
**NUMBER OF CREDITS:** 2.12 (theory) – 0.62 (practical)
**COURSE TYPE:** Theoretical and Practical



**GENERAL AIMS and DESCRIPTION:**

This required system-based block integrates the basic sciences into the study of the gastrointestinal system and metabolism in both health and disease. Each of the basic science topics is incorporated into an integrated body of knowledge utilizing both didactic and self-directed learning methods, and clinical models.

***References***

1. Drake R.L. **Gray's Anatomy for Students**. Churchill Livingstone 2010; 2nd edition. Chapter 4, pages 246-355 and 366-381, chapter 5, pages 439-441, chapter 8, pages 1030-1060 and 985-998
2. **Junqueira's Basic Histology**. McGraw-Hill Medical 2010; 12th edition, Chapters 15-16, pages 249-297
3. **Langman's Medical Embryology**. Lippincott Williams & Wilkins 2009, 11th edition, chapter 15, pages 208-231
4. **Guyton and Hall Textbook of Medical Physiology**. Elsevier 2016, 13th edition, chapters 63-64-65-66

***Gastrointestinal System (theory) subjects***

| *Session Title* | *Hrs.* |
|---|---|
| *Anatomy of Oral Cavity, Pharynx & Esophagus* | **2** |
| *Histology of Oral Cavity* | **2** |
| *Histology of Salivary Glands & General Structure of Digestive Tract* | **2** |
| *Abdominal Wall- regions & Inguinal Canal* | **4** |
| *Peritoneal Cavity & Abdominal Viscera* | **2** |
| *Abdominal Digestive Tract* | **2** |
| *Digestive Tract in Pelvis* | **2** |
| *Microanatomy of Digestive Tract* | **2** |
| *Histology of Accessory Glands of Digestive System* | **2** |
| *Vessels & Nerves of Digestive System* | **2** |
| *Embryology of Foregut* | **2** |
| *Embryology of Midgut & Hindgut* | **2** |
| *General Principles of GI System* | **2** |
| *Gastric Secretion & Salivary and Esophagus Secretions* | **2** |
| *Pancreatic, Small and Large Secretions* | **2** |
| *Bile Secretion, Gall Bladder and Liver Functions* | **2** |
| *GI Motility, Digestion and Absorption* | **2** |
| *Total hrs.* | **38** |



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***Gastrointestinal System (practical) subjects***

| *Session Title* | *Hrs.* |
|---|---|
| *Histology of Oral Cavity, Pharynx & Esophagus* | **2** |
| *Histology of Digestive Tract (Stomach, duodenum, Jejunum Ileum)* | **2** |
| *Histology of Digestive Tract in Pelvis* | **2** |
| *Anatomy of Oral Cavity, Pharynx & Esophagus* | **2** |
| *Abdominal Wall- regions & Inguinal Canal* | **4** |
| *Peritoneal Cavity & Abdominal Viscera* | **2** |
| *Abdominal Digestive Tract* | **2** |
| *Anatomy of Digestive Tract in Pelvis* | **2** |
| *Mesenteric and Inferacolin vessels* | **2** |
| *Total hrs.* | **20** |

**COURSE NAME:** Endocrine System Block
**NUMBER OF CREDITS:** 1.65 (theory) – 0.22 (practical)
**COURSE TYPE:** Theoretical and Practical

## GENERAL AIMS and DESCRIPTION:

This block integrates the basic sciences into a study of the endocrine and reproductive systems in both health and disease. Each of the basic science topics is incorporated into an integrated body of knowledge utilizing both didactic and self-directed learning methods, and clinical models.

***References***


1. **Guyton and Hall Textbook of Medical Physiology**. Saunders 2011, 12th edition, chapter 27, page 339 chapter 28, pages 345-348 and 353-357, chapters 74-79
2. **Junqueira's Basic Histology**. McGraw-Hill Medical 2010; 12th edition, chapter 20, pages 348-370
3. **Langman's Medical Embryology**. Lippincott Williams & Wilkins 2009, 11th edition, chapter 17, pages 274-275 and 267-268, chapter 18, pages 303-304 and 316-317


***Endocrine System (theory) subjects***

| *Session Title* | *Hrs.* |
|---|---|
| *Anatomy, Histology & Embryology of Hypothalamus & Pituitary Gland* | **2** |
| *Anatomy, Histology & Embryology of Thyroid, Parathyroid, Adrenal Glands & Pancreatic Islands* | **2** |
| *Introduction to Physiology of Endocrine System* | **2** |
| *Biochemical Principles of Hormones* | **2** |
| *Hypothalamus and Posterior Pituitary* | **2** |
| *Anterior Pituitary* | **2** |
| *Insulin, Glucagon, and Diabetes Mellitus* | **2** |
| *Thyroid Metabolic Hormones* | **2** |
| *Adrenocortical Hormones* | **2** |
| *Parathyroid Hormone, Calcitonin, Vitamin D and Bone* | **2** |
| *Biochemistry of Hypothalamus & Pituitary Gland* | **2** |
| *Biochemistry of Thyroid Hormones* | **2** |
| *Thyroid Metabolic Hormones* | **2** |
| *Biochemistry of Parathyroid Hormones & Regulation Mechanism of Ca2++* | **2** |
| *Total hrs.* | **28** |

***Endocrine System (practical) subjects***

| *Session Title* | *Hrs.* |
|---|---|
| *Microscopic structure of Endocrine system Glands* | **2** |
| *Macroscopic structure of Endocrine system Glands* | **2** |
| *Body Mass Index Calculation* | **2** |
| *Total hrs.* | **6** |

**COURSE NAME**: Reproductive System Block
**NUMBER OF CREDITS:** 1.24 (theory) – 0.18 (practical)
**COURSE TYPE:** Theoretical and Practical

## GENERAL AIMS and DESCRIPTION:

In the reproductive system block, students will learn how to explain the cellular and anatomical components of reproduction and early development. These components include the development of the reproductive track, development of gametes, fertilization, and formation of the germ layers, development of the embryonic environment, and endocrinology of the system. Students will learn the behaviors, attitudes and psycho-social factors that accompany the physical changes of puberty during normal development, as well as some of the psychiatric disorders that may emerge and disrupt normal development during this period. Students will also become familiar with psychosocial treatments for pre and postpartum psychiatric disorders. Finally, students will critically evaluate basic and clinical research in the field.

***References***


1. Drake R.L. **Gray's Anatomy for Students**. Churchill Livingstone 2010; 2nd edition. Chapter 5, pages 448-496
2. **Junqueira's Basic Histology**. McGraw-Hill Medical 2010; 12th edition, chapters 21-22, pages 371-411, chapter 18, pages 316-331.
3. **Langman's Medical Embryology**. Lippincott Williams & Wilkins 2009, 11th edition, chapter 16, pages 243-259, chapter 21, pages 339-344
4. **Guyton and Hall Textbook of Medical Physiology**. Saunders 2011, 12th edition, chapters 80-83


***Reproductive System (theory) subjects***

| *Session Title* | *Hrs.* |
|---|---|
| *Anatomy of Male Reproductive System* | 2 |
| *Histology of Male Reproductive System* | 2 |
| *Anatomy of Female Reproductive System & Breast* | 2 |
| *Histology of Female Reproductive System & Breast* | 2 |
| *Embryology of Reproductive System* | 4 |
| *Perineum & Radiological Anatomy of Reproductive System* | 2 |
| *Sex Differentiation* | 2 |
| *Male Reproductive Physiology* | 2 |
| *Female Reproductive Physiology* | 2 |
| *Biochemistry of Reproductive System* | 2 |
| *Total hrs.* | 22 |

***Reproductive System (practical) subjects***

| *Session Title* | *Hrs.* |
|---|---|
| *Testicle, Epididymis and Prostate gland* | 2 |
| *Ovary, Ovary fallopian tube and Uterus* | 2 |
| *Anatomy of Male reproductive system* | 4 |
| *Anatomy of Female reproductive system* | 4 |
| *Perineum & Radiological Anatomy of Reproductive System* | 4 |
| *Total hrs.* | 16 |

**COURSE NAME**: Urinary System Block

**NUMBER OF CREDITS:** 1.65 (theory) – 0.25 (practical)

**COURSE TYPE:** Theoretical and Practical

This required system based block integrates the basic sciences into a study of the urinary tract and renal system in both health and disease. Each of the basic science topics is incorporated into an integrated body of knowledge utilizing both didactic and self-directed learning methods, and clinical models.

***References***


1. **Drake R.L. Gray's Anatomy for Students.** Churchill Livingstone 2010; 2nd edition. pages 355-366, pages 421-438, pages 441-447, pages 462-477
2. **Junqueira's Basic Histology.** McGraw-Hill Medical 2010; 12th edition, chapter 19 pages: 332-347
3. **Langman's Medical Embryology.** Lippincott Williams & Wilkins 2009, 11th edition, chapter 16 pages: 232- 242
4. **Guyton and Hall Textbook of Medical Physiology**. Saunders 2011, 12th edition, chapters 25-31 pages: 285-409


***Urinary System (theory) subjects***

| *Session Title* | *Hrs.* |
|---|---|
| *Pelvic Osteology* | 2 |
| *Pelvic Diaphragm* | 2 |
| *Pelvic Circulatory & Nervous System* | 2 |
| *Anatomy of Urinary System* | 2 |
| *Histology of Urinary System* | 2 |
| *Embryology of Urinary System* | 2 |
| *Structure and function of biological water* | 4 |
| *Electrolytes* | 2 |
| *Blood PH. & Mechanism of PH regulation* | 2 |
| *Principles of ABG* | 2 |
| *Renal Basic Mechanisms, Reabsorption and Secretion* | 2 |
| *Renal and Nephron Functions* | 2 |
| *Clearance and Auto regulation* | 2 |
| *Urine Concentrating Ability* | 2 |
| *Control of Blood Volume and Acid-Base Balance* | 2 |
| *Total hrs.* | *30* |

***Urinary System (practical) subjects***

| *Session Title* | *Hrs.* |
|---|---|
| *Microscopic Structure of Urinary System* | 2 |
| *Anatomy of Urinary System* | 2 |
| *Pelvic Osteology* | 2 |
| *Pelvic Circulatory & Nervous System* | 2 |
| *Total hrs.* | *8* |

**COURSE NAME:** Anatomy of Head and Neck
**NUMBER OF CREDITS:** 1.2 (theory) – 0.5 (practical)
**COURSE TYPE:** Theoretical and Practical

**GENERAL AIMS and DESCRIPTION:**

Identify key events and stages in development of major nervous system structures. Summarize the main structures and functions within the major divisions of the normal nervous system: the brain, spinal cord and peripheral nervous system. Describe how regional nervous system structures interact to perform specific functions. Locate nervous system dysfunction based on common neurological syndromes. Synthesize vascular anatomy and neuroanatomy to locate dysfunction in ischemic stroke syndromes. Exhibit critical thinking, effective communication, problem solving and interpersonal skills to contribute to a high-performance team. Provide constructive feedback to peers and use peer feedback to identify and improve strengths and limitations in skills and attitudes.

***References***

1. **Langman's Medical Embryology**. Lippincott Williams & Wilkins 2021, 11th edition, chapter 17, pages 260-286, Chapter 10, pages 133-142, Chapter 19, pages 321-328, Chapter 20, pages 329-338

***Anatomy of Head and Neck (theory) subjects***

| *Session Title* | *Hrs.* |
|---|---|
| *Overview of Skull & Osteology* | **8** |
| *Sinuses & Fontanelles* | **2** |
| *Carotid Triangle* | **2** |
| *Posterior Triangle* | **2** |
| *Suprahyoid & Prevertebral Region* | **2** |
| *Infrahyoid Region* | **2** |
| *Face (Muscles, Parotid Gland)* | **2** |
| *Scalp, Temporal & Infratemporal Region* | **2** |
| *Oral & Nasal Cavity* | **2** |
| *Pharynx, Lymph Nodes of Head & Neck* | **2** |
| *Embryology of Head and Neck* | **2** |
| *Total hrs.* | **28** |

***Anatomy of Head and Neck (practical) subjects***

| *Session Title* | *Hrs.* |
|---|---|
| *Skull Osteology* | **6** |
| *Carotid Triangle* | **2** |
| *Posterior Triangle* | **2** |
| *Face (Muscles, Parotid Gland)* | **2** |
| *Temporal & Infratemporal Region* | **2** |
| *Applied Anatomy of head and Neck* | **4** |
| *Total hrs.* | **18** |

**COURSE NAME**: Nervous System Block
**NUMBER OF CREDITS:** 2.76 (theory) – 0.35 (practical)
**COURSE TYPE:** Theoretical and Practical

**GENERAL AIMS and DESCRIPTION:**

This required system-based block integrates the basic sciences into a study of neuroscience and behavior in both health and disease. Each of the basic science topics is incorporated into an integrated body of knowledge covering neuroanatomy, neurophysiology, neurological correlations, neuropharmacology, neuropathology, human behavior and psychiatry, utilizing both didactic and self-directed learning methods and clinical models.

***References***


1. **Snell Clinical neuroanatomy**
2. **Junqueira's Basic Histology**. McGraw-Hill Medical 2010; 12th edition,
3. chapter 9, pages 152-158
4. **Langman's Medical Embryology**. Lippincott Williams & Wilkins 2012, 12th edition,
5. chapter 18, pages 287-320
6. **Guyton and Hall Textbook of Medical Physiology**. Saunders 2011, 12th edition, Chapters 45-48, Chapters 54-60


***Nervous System (practical) subjects***

| ***Session Title*** | ***Hrs.*** |
|---|---|
| ***Anatomy of the vertebral canal and spinal cord*** | **2** |
| ***Spinal cord and spinal nerves*** | **2** |
| ***Autonomic nervous system and the body dermatome*** | **2** |
| ***Brainstem and cerebellum*** | **2** |
| ***Dyansfal and the cerebral hemispheres*** | **2** |
| ***Vessels and membranes of the brain and cranial nerves*** | **2** |
| ***Applied anatomy of the brain vessels, blinds and sinus Cranial venous*** | **2** |
| ***Histology of the spinal cord, cerebellum, cerebral cortex and nerve tissue*** | **2** |
| ***Investigating the neural reflex*** | **2** |
| ***Two-point discrimination*** | **2** |
| ***Total hrs.*** | **20** |

*Nervous System (theory) subjects*

| *Session Title* | *Hrs.* |
|---|---|
| *Division of the nervous system & spinal cord appearance* | **2** |
| *The internal structure of the spinal cord* | **2** |
| *Medulla oblongata* | **2** |
| *Pons* | **2** |
| *Midbrain* | **2** |
| *Cerebellum* | **2** |
| *Diencephalon* | **2** |
| *Cerebral hemispheres* | **2** |
| *The cerebral hemispheres and basal Nuclei* | **2** |
| *Limbic system and reticular formation* | **2** |
| *Vessels and Meninges* | **2** |
| *The structure of cranial nerves* | **2** |
| *Embryology of Nervous system* | **2** |
| *Radiological and clinical anatomy of brain and spinal cord* | **2** |
| *Organization of Nervous System* | **2** |
| *Somatic Sensations: Tactile and Position Senses* | **2** |
| *Sensory Receptors, Neuronal Circuits for Processing Information* | **2** |
| *Somatic Sensations: Pain and Thermal Sensations* | **2** |
| *Motor Functions of the Spinal Cord* | **2** |
| *Cortical and Brain Stem Control of Motor Function* | **2** |
| *The Cerebellum* | **2** |
| *Basal Ganglia* | **2** |
| *The Autonomic Nervous System* | **2** |
| *Cerebral Cortex, Learning, and Memory* | **2** |
| *Sleep and Brain Waves* | **2** |
| *The Limbic System* | **2** |
| *Total hrs.* | **52** |

**COURSE NAME**: Special Senses System Block
**NUMBER OF CREDITS**: 0.88 (theory) – 0.17 (practical)
**COURSE TYPE**: Theoretical and Practical

**GENERAL AIMS and DESCRIPTION:**

The most important concepts and common disorders in dermatology, otolaryngology and ophthalmology are discussed during a three-week period. The skills in the performance of proper procedures for diagnosis and treatment of minor and urgent disorders are acquired. Emphasis is placed on the recognition of manifestations of common systemic disorders.

***References***


1. **Junqueira's Basic Histology**. McGraw-Hill Medical 2010; 12th edition
Chapter 23, pages 412-438
2. **Langman's Medical Embryology**. Lippincott Williams & Wilkins 2021, 11th edition
Chapter 19, pages 321-328
Chapter 20, pages 329-338
3. **Guyton and Hall Textbook of Medical Physiology**. Saunders 2011, 12th edition
Chapters 49 & 50: pages 597-621
Chapters 50 & 51: 609-632
Chapter 52 & 53
Chapter 55: pages 674-678


***Special Senses (theory) subjects***

| *Session Title* | *Hrs.* |
|---|---|
| *Macroscopic structure of the eyes* | **2** |
| *Macroscopic structure of ears* | **2** |
| *Microscopic structure of eyes and ears* | **2** |
| *Embryology (Development) of eyes and ears* | **2** |
| *The Eye: Optics of Vision* | **2** |
| *The Eye: Neural Function of the Retina and Central Neurophysiology of Vision* | **2** |
| *The Sense of Hearing* | **2** |
| *Vestibular Sensations and the Chemical Senses— Taste and Smell* | **2** |
| *Total hrs.* | **16** |

***Special Senses (practical) subjects***

| *Session Title* | *Hrs.* |
|---|---|
| *Anatomy of the eye and contents the eye* | **4** |
| *Anatomy of the ear and contents the eye* | **2** |
| *Applied anatomy of the eye and ear* | **2** |
| *Histology of the eye and ear* | **2** |
| *Ophthalmoscopy, otoscopy and perimetry* | **2** |
| *Total hrs.* | **12** |

**COURSE NAME:** Medical Microbiology
**NUMBER OF CREDITS:** 2.4 (theory) – 0.6 (practical)
**COURSE TYPE:** Theoretical and Practical

**GENERAL AIMS**

1. Learning the principles of microbiology, including the structural and physiological properties of microorganisms and their roles in diseases and the methods to control them.
2. Classification of pathogens
3. Treatment of bacterial diseases
4. Familiarizing students with the structure of microorganisms, staining, lam preparation

**LEARNING OUTCOMES**

**Students must:**

1. Know microbial and physiological principles
2. Know the methods and problems of microorganism classification
3. Know pathogenic and epidemiological mechanisms
4. Know antiseptic effect mechanisms
5. Know control methods the mechanisms of antibiotic effects
6. know the methods to determine the effect mechanisms of antibiotics
7. Be able to explain the relationship between dosage, parasite and the drug.
8. Know protection methods while working with microorganisms
9. Know methods to work with microorganisms, microscope use and microscopic and macroscopic identification of microorganisms
10. Be able to do cell culture and perform identification experiments
11. Perform antibiogram tests and know and examine antibiotic effects
12. Know microbiology lab equipment
13. Know staining methods
14. Be able to prepare culture medium
15. Know microorganism identification methods

***References***

1. **ZINSSER MICROBIOLOGY.** 13th Edition. Reviewed by Ernest Jawetz.

***Microbiology (practical) subjects***

| Session Title | Hrs. |
|---|---|
| *Laboratory Safety, Sterilization, and Culture media* | *2* |
| *Specimen Collection, Bacterial Identification and staining* | *2* |
| *Bacterial Cultivation* | *2* |
| *Antimicrobial Susceptibility Testing* | *2* |
| *laboratory identification of Staphylococci* | *2* |
| *laboratory identification of Neisseria and Moraxella catarrhalis* | *2* |
| *lab. identification of Streptococcus, Enterococcus, and Other Catalase Negative, Gram-Positive Cocci* | *2* |
| *lab. identification of Corynebacterium, and Similar Organisms* | *2* |
| *lab. identification of Bacillus and Similar Organisms* | *2* |
| *laboratory identification of Enterobacteriaceae and Pseudomonas* | *2* |
| *laboratory identification of Mycobacterium* | *2* |
| *laboratory identification of Vibrio* | *2* |
| *Review* | *2* |
| *Total hrs.* | *26* |

***Microbiology (theory) subjects***

| Session Title | Hrs. |
|---|---|
| *Bacterial Classification, Microbial Cell Structure and Function* | *2* |
| *Commensal and Pathogenic Microbial Flora in Humans* | *2* |
| *Bacterial Metabolism and Microbial Growth* | *2* |
| *Microbial Growth, Environmental Effects on Microbial Growth* | *2* |
| *Bacterial Genetics* | *2* |
| *Antibiotics* | *2* |
| *Sterilization, Disinfection, and Antisepsis* | *2* |
| *Staphylococcus and Related Gram-Positive Cocci* | *2* |
| *Streptococcus, Enterococcus and Other Gram-Positive Cocci* | *2* |
| *Neisseria and Related Genera* | *2* |
| *Corynebacterium, Listeria and Erysipelothrix* | *2* |
| *Spore-forming Gram-Positive Bacteria (Bacillus)* | *2* |
| *Clostridium* | *2* |
| *Mycobacterium* | *2* |
| *Mycobacterium, Nocardia and Related Bacteria* | *3* |
| *Pseudomonas, Related Bacteria* | *2* |
| *Enterobacteriaceae (Klebsiella, Escherichia, Proteus)* | *3* |
| *Acinetobacter, Haemophilus and Related Bacteria* | *2* |
| *Enterobacteriaceae ( Salmonella, Yersinia, Shigella)* | *3* |
| *Bordetella, Francisella, Brucella and Legionella* | *2* |
| *Vibrio, Campylobacter and Helicobacter* | *2* |
| *Treponema, Borrelia and Leptospira* | *2* |
| *Chlamydia, Mycoplasma* | *2* |
| *Rickettsia, Orientia, Chlamydia, Chlamydophila, Mycoplasma and Ureaplasma* | *2* |
| *Total hrs.* | *51* |

**COURSE NAME:** Medical Virology
**NUMBER OF CREDITS:** 1.0 (theory)
**COURSE TYPE:** Theoretical

## GENERAL AIMS

1- Familiarity with the general science of medical virology
2- Understanding the structure, characteristics, and proliferation of pathogenic viruses concerning clinical phenomena (symptoms, pathology, incidence, and epidemiology) of viral infections in humans.
3- Knowledge of methods of diagnosis and application of virological methods in understanding clinical and epidemiological phenomena regarding viral infections
General goals 70

This course is intended to provide an overview of medical virology, understanding the characteristics of pathogenic viruses, diagnosis methods, and epidemiology of viral infections in Iran.

***References***

**ZINSSER MICROBIOLOGY.** 13th Edition. Reviewed by Ernest Jawetz.

| *Session Title* | *Hrs.* |
|---|---|
| ***Significance of Viral diseases, History ،Structure of Viruses Classification of Viruses،Replication of viruses, and viral pathogenesis*** | ***2*** |
| ***Control of Viral infections: Antiviral agents, interferon, Viral vaccines, Diagnosis of viral infections, and viral nosocomial infections*** | ***2*** |
| ***Parvoviridae, Papovaviruses, Adenoviridae, Poxviridae, and Herpesviridae family (HSV-1&2)*** | ***2*** |
| ***Herpesviridae family, (HHV-1 thru 8), Hepatitis viruses (B-D)*** | ***2*** |
| ***Hepatitis viruses (C), Hepatitis viruses (A-E)*** | ***2*** |
| ***Picornaviridae (polio ،coxsackie ،Echo & paraechoviruses) Caliciviruses (Norovirus), Togaviridae, (Rubella virus)*** | ***2*** |
| ***Flaviviridae (Dengue, Zika, and Yellow Fever viruses), Retroviridae (HIV-1 & 2 – HTLV)*** | ***2*** |
| ***Paramyxoviridae (Metapneumovirus, Parainfluenza ،Measles، Respiratory Syncytial Virus Orthomyxoviridae (Influenza viruses (A. B)*** | ***2*** |
| ***Rabdoviridae (Rabies virus), Viruses and Human Cancer (HPV/ EBV/ HBV/HCV)*** | ***2*** |
| ***Total hrs.*** | ***18*** |

**COURSE NAME:** Immunology
**NUMBER OF CREDITS:** 1.8 (theory) – 0.2 (practical)
**COURSE TYPE:** Theoretical and Practical

**GENERAL AIMS**

Familiarizing students with the science of immunology and its use in understanding, preventing, diagnosis and treatment of disease.

The functions of the immune system and body defense mechanisms, different body organs which have significant roles in the functions of the immune system and the different types of immunity in body will be covered. Moreover, in practical the aim is familiarizing students with different lab equipment and diagnostic testing kits and their use.

At the end of this course, the student should be immersed in the science of immunology, members, the molecules and cells involved in the immune system and understand the different mechanisms of the immune system in dealing with foreign agents. Also, how the immune system responds to various diseases, including infectious diseases, autoimmune, cancer, transplant, and understanding the immune mechanisms in identifying and diagnosing various diseases.

**Skills:**

Medical students should know how to perform diagnostic methods of immunity and serology and their application in diagnosing various diseases, analyzing immunological and serological tests (in terms of positive and negative), and performing various immunological and serological tests such as agglutination test, perspiration, hemolysis, etc.

**The practical part of the immunology course** is designed to acquaint medical students with **common serological diagnostic methods** for diagnosing infectious diseases (parasitic, bacterial, viral, and fungal, blood groups, autoimmune diseases, serotyping, etc.) Students will also learn basic **essential laboratory test methods** in this course, and **perform serology tests** in the laboratory, and **interpret the tests' results**. They will also become familiar with more specialized tests and their application in diagnosing diseases.

**LEARNING OUTCOMES**

**Students must:**

1. Know pathogens and immunologic mechanism of diseases
2. Know resistance against diseases
3. Know lab diagnosis methods
4. Know immunologic substances used to cure diseases

***Immunology (theory) subjects***

| *Session Title* | *Hrs.* |
|---|---|
| *Introduction to Immunology* | *2* |
| *Cells and organs of the Immune system* | *2* |
| *Antigens* | *2* |
| *Antibodies* | *2* |
| *Complement System* | *2* |
| *Antigen-Antibody Interactions* | *2* |
| *Cytokines* | *2* |
| *Major Histocompatibility Complex(MHC) and Antigen presentation* | *2* |
| *Innate Immunity and Inflammation* | *2* |
| *Genetic basis of antigen receptors diversity* | *2* |
| *Development and activation of B lymphocytes (Humoral Immunity)* | *2* |
| *Development and activation of T lymphocytes (Cell mediated Immunity)* | *2* |
| *Mechanisms and Classification of Hypersensitivity* | *2* |
| *Immunology of Infectious diseases* | *2* |
| *Mucosal Immunity* | *2* |
| *Immunohematology* | *2* |
| *Immunodeficiency* | *2* |
| *Mechanisms of Autoimmunity* | *2* |
| *Immune responses to Tumors* | *2* |
| *Vaccines and Vaccination* | *2* |
| *Transplantation Immunology and Immunopharmarcology* | *2* |
| *Immunologic Tolerance* | *2* |
| *Total hrs.* | *44* |

***Immunology (practical) subjects***

| *Session Title* | *Hrs.* |
|---|---|
| *Introduction (Check in, syllabus, preliminary session)* | *2* |
| *Hemagglutination Reactions* | *2* |
| *Agglutination Reactions* | *2* |
| *Neutralization Reactions* | *2* |
| *Immunoprecipitation- Reactions* | *2* |
| *Elisa, Radioimmunoassay* | *2* |
| *IF, Flowcytometery* | *2* |
| *Cell Isolation Techniques, Lymphocytotoxicity* | *2* |
| *Molecular Tests* | *2* |
| *Total hrs.* | *18* |

**COURSE NAME:** Medical Genetics
**NUMBER OF CREDITS:** 2.0 (theory)
**COURSE TYPE:** Theoretical

## GENERAL AIMS

The increasing impact of genetics in healthcare and the development of newer sophisticated technologies require close collaboration between research scientists, clinical laboratory scientists and clinicians to deliver a high quality service to patients. The Medical Genetics course covers basic concepts of genetically disorders and the clinical genetics service, including risk analysis and application of modern genetic and genomic technologies in medical genetics research and in diagnostics and population screening.

## LEARNING OUTCOMES

**Students must:**

1. Know the History and Significance of Medical Genetics in the clinic.
2. Know the Genetics of Metabolic, Neurologic and Musculoskeletal Disorders.
3. Know Population Genetics and Medicine.
4. Know Modern Molecular Medicine- Gene Therapy.

***References***


1. ***Human Genetics from Molecules to Medicine. (1ed) 2012. Christian P Schaaf,Johannes Zschocke. Lorraine Potocki, Wolters Klumer, Lippincott Williams & Wikins, Baltimore, Maryland***
2. ***Elsevier's Integrated Review Genetics, (2ed), 2012, Linda R. Adkison, Elsevier Saunders Philadelphia, Pennsylvania***

***Medical genetics (theory) subjects***

| *Session Title* | *Hrs.* |
|---|---|
| *History and Introduction to Medical Genetics* | *2* |
| *Molecular Genetics, Gene Mutation and Applications* | *2* |
| *Modes of Monogenic Inheritance* | *2* |
| *Chromosomes in the Cell G-Banding and karyotyping* | *2* |
| *Genetics of Neurologic Disorders* | *2* |
| *Cancer Genetics* | *2* |
| *Genetics of Metabolic Disorder and Newborn Screening* | *2* |
| *Genetics of Hematologic Disorders* | *2* |
| *Genetics of Musculoskeletal & Cardiovascular Disorders* | *2* |
| *Principles of Genetic Counseling* | *2* |
| *Genetics of Renal, Gastrointestinal, and Hepatic Disorders* | *2* |
| *Genetic Engineering and its applications in Medicine* | *2* |
| *Disorders of sexual differentiation and development* | *2* |
| *Population Genetics and Medicine* | *2* |
| *Diagnostic approach for a child with multiple Anomalies or Dysmorphic features* | *2* |
| *Modern Molecular Medicine-Gene Therapy* | *2* |
| *Individualized Medicine* | *2* |
| *Total hrs.* | *34* |

**COURSE NAME:** Principles of Public Health
**NUMBER OF CREDITS:** 1.5 (theory)
**COURSE TYPE:** Theoretical

**GENERAL AIMS**

In this course, the student should be acquainted with the general concepts and History of health in Iran and the world and know the health systems globally. They should understand the concepts of health and disease and recognize the threats to health and the transition of health systems globally and in Iran. They have to learn the concept of health for all and levels of prevention and be able to apply primary health care and manage and assess risk based on levels of prevention. They should know the role of national and transnational organizations in health development. Students should learn the basic concepts of health education and health promotion, establish health system communication, and educate clients in health services. Students should learn sustainable development goals and recognize the role of social factors affecting health to use them in patient management. Students should understand the importance of environmental and occupational health and recognize their role in promoting population health. Students must be familiar with food hygiene and nutrition in health and apply its principles in related areas. Students should understand the importance of oral hygiene and become familiar with health technology assessment. Students should know the immunization program and be able to guide its implementation.

**Lesson Description**

In this course, the student is introduced to the basic principles and foundations of health to work as a physician in maintaining and promoting the health of the individual and the population

1-health (definitions, spectrums and dimensions)
2-health education, health promotions and preventions.
3-social determinants of health
4-public health foundations
5-environmental health (introduction, water safety, water born disease, climate, Air pollution)
6-health system in IR Iran (definitions, objectives and functions)
7-Health care planning
8-levels for health care (historical evolution)
9- Immunization against Major Infectious Diseases.
10-general health care on mothers and children's
11-healthy life style and behaviors
12-Occupational health
13-medicine as profession (professional medical duties)
14- Principles and methods for preventing occupational diseases.
15-national and International health agenesis.
16-quality and safety in health care delivery
17-health status in Iran and the world.

**COURSE NAME:** Epidemiology
**NUMBER OF CREDITS:** 2.0 (theory)
**COURSE TYPE:** Theoretical

**GENERAL AIMS**

In this course, the student gets acquainted with the basic principles and foundations of epidemiology to work as a physician by recognizing the epidemiological features of diseases and their indicators and rates in maintaining and promoting the health of the individual and the population.

1-definition of epidemiology, encounter ecologic with diseases
2- common terms in epidemiology
3-factors of physics diseases, chemical and biologic
4-host factors
5-environmental factors of physiochemical, biological and social
6-epidemics and prevention.
7-general and types of epidemiological studies
8-epidemiology and control the diseases that can be prevented by vaccine

**Educational partners international E.P.I: (6 hours)**

1-vaccine, making, maintenance and usage
2-how to make and manage a center of vaccination
3-how to evaluate the practical E.P.I program

**Epidemiology and controlling Diarrheal disease (5 hours)**

1-definition, importance, epidemiology and pathology of Diarrheal disease
2-definition and types of Dehydration and the recognition of its degree
3-Diarrheal treatment with considering the prevention and treatment of dehydration
4-preventing and controlling Diarrheal disease and health education, health food, improvement of environment and struggle with fly.

**Other major diseases (4 hours)**

1-General information about other common infectious diseases in Iran (Tuberculosis - Malta Malaria –Malaria)
2-General on some of the specific diseases in Iran (Rabies and leprosy ...)
3-Epidemiology and control of no communicable diseases (cancers, rheumatism, and cardiovascular diseases, Events and poisonings and ...)

**LEARNING OUTCOMES**

**Students must:**

1. Know the basic principles of epidemiology and health care.
2. Know the level of health care services.
3. Know the health care system compartments and understand the role of the pharmacist in the system.

**COURSE NAME:** Psychology
**NUMBER OF CREDITS:** 2.0 (theory)
**COURSE TYPE:** Theoretical

## GENERAL AIMS

Knowing the basic principles of psychology, different sense and thought processes is central to building a more effective relationship between the pharmacist and the patient and therefore this course will increase the knowledge of the pharmacist and familiarizing students with the principles of psychology and learning methods, thought process and perception

## LEARNING OUTCOMES

**Students must:**

1. Know the relationship between psychology and human mind and soul.
2. Know the principles of psychology.
3. Be able to explain different sense stages.
4. Know learning methods and thought processes.
5. Know human motivation.
6. Know psychological health.
7. Know the physiological principles of psychology.

***References***

1. **Atkinson & Hilgard's Introduction to Psychology**-Last Edition

***General Psychology(theory) subjects***

| *Session Title* | *Hrs.* |
|---|---|
| *Nature of Psychology* | *4* |
| *Neurobiological basis of Psychology* | *4* |
| *Factors in Psychological Development* | *2* |
| *Perception* | *2* |
| *State of Consciousness* | *2* |
| *Learning* | *2* |
| *Motivation and Emotion* | *2* |
| *Personality* | *2* |
| *Conflict and Stress* | *2* |
| *Abnormal psychology* | *4* |
| *Methods of Therapy* | *4* |
| *Course review* | *2* |
| *Total hrs.* | *32* |

**COURSE NAME:** Parasitology / Mycology
**NUMBER OF CREDITS:** 2.0+1.0 (theory) – 1.0 (practical)
**COURSE TYPE:** Theoretical and Practical

## A) Parasitology

It is expected that the student will be familiar with the parasitic causes of diseases at the end of this course. Recognize important pathogenic parasites within protozoan and worm groups. Students should know the morphology, life cycles, transmission routes, reservoirs, hosts, the roles of arthropods as biological and mechanical carriers in transmission, the specific pathogenesis and clinical signs of each one of them. They should know the geographical spread of each parasitic infection, their incidence and prevalence, especially in different parts of Iran. Also, they need to know the methods of prevention and control of each parasitic disease.

**GENERAL AIMS**

In this course, students will know the etiological factors, life cycle, pathogenesis, transmission, sampling methods, requesting the needed laboratory tests for diagnosis, methods of prevention, and control of parasitic diseases (mentioning their clinical cases) are familiar.

## B) Mycology

At the end of this course, the student is expected to identify important pathogenic fungi. Recognize fungal agents that cause diseases. They should know the geographical distribution of each fungal infection and the status of their incidence and prevalence, especially in different parts of Iran. Diseases caused by important fungi should be detected using a slide. Also, they need to know the methods of prevention and control of each fungal disease and explain it.

**GENERAL AIMS**

In this course, students are introduced to the etiological factors of fungal diseases. They will learn the transmission method of each fungal pathogen and its prognosis. Laboratory diagnosis and request for the type of test and familiarity with the principles of treatment using effective and common drugs in the country and familiarity with methods of prevention and control of these diseases are the main educational items in the course of medical mycology.

Theoretical (43 hours)

1. Protozoa (11 hours)

Malaria parasites of humans (Plasmodium vivax, Plasmodium malaria) toxoplasma gondiiSarcocystis, isosporahominis, flagellates blood and tissues leishmaniasistropica, donovani and brasillines and trypanosome briefly), flagellates gastrointestinal and genitourinary (Giardia lamblia and other flagellates of the digestive system and trichomonasvaginalis), ciliophora (balantidium coli) - amytes (Anthombochistolithic, Free-living damage and other digestive amoebae) – pneumocystis

2. Helminthology (15 hours)

Trematodes (Fasciola, Dictyostelium, Schistosomes and other pathogens) Patches (Tetails, Echinococcus and Hydatid Cyst, Hymenolipse, Diphilopotrim and Dipilidium) Symptoms (Ascaris, Axialis, Trichococeple, hookworms, Trichostrongylus, stroganuloidus, pyok, trichin, fillers and migratory larvae)

3.Arthropod (8 hours)

Lice (Pedigo Deluxe Hermannus and FetriusPubissa) cimex, lectularius and tribatomasFleas (Gonzapopalacnopsis and bagestoni, polksirinens, dosozpocilusfasciatus and centenosofuscanis), flies (Muscadumyscica and sorbiantaobnus and gazizops) - myiases - anopheles carriers of malaria in Iran - colexes, aedes and teobaldia - phlebotomes carrying disease in Iran - colicoidises and simuloids - mites (ernietudorustoulouse and lachusenesis, arcaspericusus, hialomorphsbpisfalus, scabbard sarcidis) - household beetles and some inseminates of essenophyllite.

4. Fungi (9 hours)

Saprophytic fungi (Penicillium, Aspergillus, mucurium, Cladosporium, ascorporalaripipis, avezarium, streptomyoscystrottora) Causes of surface fungal diseases (malaria, muconcea, aspergillus, penicillium, mucocandides) The causes of cutaneous fungal diseases (octotrexes, endotheres, favors, milium, arthrospores,

microspores, trichophytones and epidermophyton) causes of subcutaneous fungal diseases (mycototicactinomyoma, myastoma) causes of mucosal fungal diseases (Candida albicans and other candidates) causes of visceral fungal diseases (Cryptococcus, neoformense, histoplasmacapsulatum, types ofaspergillosis and Nocardiaastroids)

B. Practical (51 hours)

This lesson is conducted in accordance with the faculty facilities and observing the following issues.

1. Protozoology

In this section, the methods of laboratory diagnosis of protozoal diseases and the practical value of each of them, and blood, tissue and stool testing techniques, sample collection methods, laboratory tests, staining and microscopic testing are presented.

2. Helminthology

In this section, the methods of laboratory diagnosis of helminth diseases, faecal and urinary testing techniques, the morphological study of each helminth and egg and larvae and their intermediate host are trained.

3. Entomology

In this section, the biology and morphological diagnosis of the important arthropod in terms of the transmission of the disease and ways to combat them are presented.

4. Mycology

In this section, methods of laboratory diagnosis of fungal diseases, sampling, direct testing and macroscopic culture of saprophytic and pathogenic fungi are presented.

***References***

1. **Paniker's Text Book of Medical Parasitology** 7th Edition Chapter 1 to 24.

**COURSE NAME:** Medical Physics
**NUMBER OF CREDITS:** 2.0 (theory)
**COURSE TYPE:** Theoretical

**Objectives**

1. 1- Familiarity of medical students with the basics and physical bases of imaging methods and measuring changes
2. Anatomical and physiological in vivo
3. 2- Familiarity with how to choose common diagnostic imaging methods in patients
4. 3- Familiarity with how to analyze and interpret changes caused by diseases using diagnostic devices

In this course, the students get acquainted with the physics and general concepts of diagnostic methods and related devices so that in the following stages of education, they can understand the algorithms for selecting and requesting diagnostic methods, especially imaging for patients; and to recognize differences in noise and visual errors from disease and pathological changes, after receiving the results or images of patients.

**LEARNING OUTCOMES**

**Students must:**

5. Know the optic physics: -the importance and properties of the visible light. Ultraviolet rays, infrared rays and its medical expenses.
6. Know the Physical examination of the eye, diagnosis and treatment of fractal abnormalities in the eye. -astigmatism and the ways for correction. -retinal properties, FOV, sharpness, ophthalmoscopy. -camera, proximity, prominence recognition.
7. Know the ultrasound waves and its medical expenses. -ultrasound production and properties.
8. Know the high frequency currents application in medicine. The effects of electric current on the body and the way of protection.
9. Know the Nuclear Medicine and physical foundation of radiology and radiotherapy

**Core Syllabus:**

**1- physics, Optics, and vision:**

- Importance and properties of visible light, infrared and ultraviolet rays, and their medical uses
- Physical study of the eye to diagnose and correct spherical abnormalities
- Fundamentals of the physics of astigmatism and ways to correct it
- Fundamentals of physics of retina, visual field, visual acuity, detection of colors, and ophthalmoscopy
- Basics of physics regarding binocular vision, hyperopia, Understanding the protrusion of objects
- Fundamentals of physics regarding the common lens equipment used in medicine
- practical program

**2- Ultrasound waves and their medical uses**

- Production and properties of ultrasound waves
- Chemical and biological properties of ultrasound waves
- Application of ultrasound waves in medicine
- Fundamentals of physics of common ultrasound equipment in medicine

**3- Applications of frequency currents in medicine**

- Production and properties of high-frequency currents
- Physiological properties and application of high-frequency currents in medicine (electrotherapy, heat therapy)
- The adverse effects of electricity on the body and ways of protection
- Basics of Magnetic Resonance Imaging (MRI) (Image Formation Mechanism)
- Different contrasts on MRI
- Basics of physics of common equipment of high-frequency currents used in medicine

**4- Nuclear medicine**

- Atom structure and nuclear energy
- Radioactivity and its properties (ionizing rays)
- Natural radioactivity
- Neutrons of artificial radioactivity
- Radioactivity detection and measurement
- Isotopic molecules and their medical applications
- Uses of radioisotopes in diagnosis and treatment
- Practical program

**5- Physical foundations of radiology and radiotherapy**

- The nature and properties of X-rays in diagnosis and treatment
- X-ray generators / X-ray absorption and measurement
- Radiobiology / Protection and principles of X-ray and gamma radiation dosimetry
- Practical program

6- Applications of robotics in medicine

**COURSE NAME:** General Principles of Nutrition
**NUMBER OF CREDITS:** 2.0 (theory)
**COURSE TYPE:** Theoretical

## GENERAL AIMS

In this lesson, the student becomes familiar with general concepts, learns the nutritional properties of energy and food groups, and learns the general principles of nutrition in pregnant and lactating mothers, children, and the elderly to make nutritional assessments accordingly.

## LEARNING OUTCOMES

**Students must:**

1. Know the Role and Importance of Nutrition
2. Know the Nutrients and their original sources
3. Know the Nutrients and their original sources
4. Know the Understanding the regional culture, traditions, and habits of nutrition and its relation with the nutritional status of individuals and communities and organizing nutritional program
5. Know the Nutrition of susceptible groups
6. Know the Methods of assessment of nutritional status
7. Know the diseases resulting from malnutrition and preventing them
8. Know the Safety of nutritional materials
9. Know the Toxicity of nutritional materials

**Core Syllabus:**

1-General nutrition and health and nutritional recommendations

2- Food groups

3- Carbohydrates (sugar sweets, dietary fiber, the nutritional importance of carbohydrates, and the need for carbohydrates)

4- Fats (nutritional importance of fats and the need for fats)

5- Proteins (Complete and incomplete proteins, quality of proteins, nitrogen balance, and the need for proteins)

6- Energy

7- Fat-soluble vitamins (food sources, deficiency, and poisoning)

8- Water-soluble vitamins (food sources, deficiency)

9- Minerals and water (food resources, deficiency)

10- Obesity and general malnutrition (diseases caused by malnutrition)

11- Nutrition in pregnant and lactating mothers

12- Nutrition in children

13- Nutrition of the elderly

14- Assessment of nutrition status

15- Principles of diet management

**COURSE NAME:** Medical Terminology 1
**NUMBER OF CREDITS:** 3.0 (theory)
**COURSE TYPE:** Theoretical

**GENERAL AIMS**

At the end of this course, the student should read and understand English medical texts. Understand academic and medical terms and vocabulary, talk about mental medicine topics, and understand what others say about medical topics quickly. Also, understand the importance of English in teaching activities at a given time and in collaboration with the group. (As an attitude goal)

Due to the growing need for medical students and graduates to reading medical books and articles to increase and update their medical knowledge and conduct research in various topics related to this field, this course tries to increase the ability and skill of students to read and understand medical texts. For this purpose, most of the class time (about two-thirds) is devoted to teaching techniques related to reading and understanding the text. Students' need to speak English in real (face-to-face) and virtual environments are considered in this course. For this reason, part of the class time is dedicated to practicing listening and speaking techniques. In this regard, language classes should be held to the detriment of English. In addition, each student will be required to speak at least 5 minutes to the detriment of English in class.

This course intended from this books

***References***

1. **Saunders, Guyton 1979**, physiologic of the human body
2. **Cohen Medical Terminology**, 8th Edition. by Barbara J. Cohen BA MSEd (Author), Ann DePetris RN BSN MSA (Author)

**COURSE NAME:** Medical Terminology 2

**NUMBER OF CREDITS:** 3.0 (theory)

**COURSE TYPE:** Theoretical

**Prerequisite: Termnology1**

**GENERAL AIMS**

At the end of the second specialized language course, medical students should easily read and understand medical texts in English with a higher level of difficulty and specialized language. Understand and use more academic terms and vocabulary, talk more fluently about medical topics, and better understand medical discourse. Students also need to apply language skills in group activities (focusing on medical topics).

#In this course (continuing and completing the objectives of the specialized language course, students' abilities to read, speak and listen are discussed. So that students can easily search for the concepts they need from specialized English sources and present their findings in English.

This course heavier than Termnology1 and it is taught from practical courses of some universities

***References***


1. **Saunders, Guyton 1979**, physiologic of the human body
2. **Cohen Medical Terminology**, 8th Edition. by Barbara J. Cohen BA MSEd (Author), Ann DePetris RN BSN MSA (Author)

**COURSE NAME:** General Pathology
**NUMBER OF CREDITS:** 3.0 (theory), 1.0 (practical)
**COURSE TYPE:** Theoretical, Practical

Core syllabus of General pathology:
•General pathology and cell damage

• Pathology of inflammation. Tissue repair and hemodynamic disorders

• Pathology of human immune system disorders

• Neoplastic pathology

• Pathology of genetic disorders and childhood diseases

• Pathology of peripheral diseases. Nutritional and infectious

• Practical pathology

• Clinical pathology

• Advanced pathology

• Cardiovascular

• Respiratory machine

• Kidneys and upper urinary tract

• digestive system

• Liver and bile ducts

• The genital system, lower urinary tracts, and breast
• Blood diseases. And endocrine glands

• Skin, soft tissue, bones, and joints

• Central nervous system

**A) General pathology and cell damage**
In this course, the student should be familiar with the concepts of pathology, pathological manifestations of cell damage. Recognize cell death well enough to use them to diagnose the clinical phenomena of hemodynamic disorders. Immune disorders in the human body. Tumor. Genetic disorders. Environmental Diseases »Malnutrition 3 Infectious diseases
In this lesson, the process of cell damage, inflammation, cell death, and tissue repair are taught.
**General pathology (1 hour)**
-Definition of pathology
- History of pathology
- Definition of the disease
- Important points of a disease (definition. etiology, clinical signs, etc.)
- Pathogenic mechanisms in the human body
- Defensive mechanisms of the human body in various diseases

- Methods of diagnosing diseases
- The role of the laboratory in the diagnosis, treatment, and follow-up of diseases

**Cell damage. Cell death and adaptation (8 hours)**

- Cellular and tissue responses to harmful factors
- Cellular and tissue adaptation (hypertrophy - hyperplasia - atrophy - metaplasia)
- Cell damage and cellular and tissue death: causes, factors, tissue changes and examples of it (types of necrosis and apoptosis)
- intracellular and tissue accumulations (calcium deposition, accumulation of fat, protein, glycogen and pigments and amyloidosis)
- The aging process
- Clinically important tips for cellular damage, causes, factors, and examples

**B) Pathology of inflammation. Tissue repair and hemodynamic disorders**

In this course, the student should know the inflammation and tissue repair changes to use them in the clinical phenomena of hemodynamic disorders, immune disorders, tumors, genetic disorders, environmental diseases, malnutrition, and infection.

# Lesson Description

In this lesson, inflammatory changes and tissue repair processes are taught.
In this course, based on cell damage and cell death, inflammation and tissue repair are taught.
Essential content

**Inflammation and tissue repair (6 hours)**

- General and important points about inflammation and inflammatory phenomena in the human body
- Types of inflammation and its taxonomy
- Tissue changes during inflammation
- Inflammation mechanism
- Effects and consequences of various types of inflammation in the human body
- Tissue repair, its mechanism, results, and its importance
- Important clinical points related to inflammation and tissue repair and examples of them

**Hemodynamics (4 hours)**

- General and important points about blood circulation and fluids in the body
- Hyperemia
- Edema
- Bleeding
- Hemostasis
- Thrombus
- Embolism
- Infarction
- Shock
- Clinically important points related to each of the hemodynamic disorders and examples of them

Pathology education can be integrated into independent educational packages while observing the titles, content, and educational hours approved in the organized educational program of the university.

**C) Pathology of human immune system disorders**

In this lesson, based on the process of cell damage, cell death, inflammation, and tissue repair, and the pathological manifestations of hemodynamic disorders, immune disorders are taught in the human body.

**Immune disorders in the human body**

- General knowledge of the immune system and how it works, its monitoring and care of the human body

- Injuries caused by dysfunction of the immune system
- Hypersensitivity, causes, types, and damages caused by it
- Autoimmunity, causes, types, and damages caused by it
- Impaired immune system (immunodeficiency), causes, types, and injuries
-Tissue transplantation, definition, types, and mechanisms of graft rejection
- Amyloidosis
- Important clinical tips and examples related to any of the disorders of
the human immune system

**Pathology of neoplasia**

10 hours

Basic Science / Clinical Introduction

In this course, the student should be familiar with tumors and neoplastic changes.

**Pathology of inflammation and tissue repair**

process of cell damage, cell death, inflammation, and tissue repair,
pathological manifestations of hemodynamic disorders and immune disorders in the human body;
Tumors and neoplastic changes.
- How to name tumors
- Characteristics of benign and malignant neoplasms
- Different stages of carcinogenesis and hallmarks
- Etiology of cancers
- Host response to tumor
- Clinical perspectives on neoplasms

Pathology education can be integrated into independent educational packages by observing the preservation of the titles, content, and educational hours approved in the organized University's educational program.

**D) Pathology of genetic disorders and childhood diseases**

General Objectives

In this course, the student should understand the pathology of
genetic disorders and childhood diseases.

## Lesson Description

In this lesson, genetic disorders and childhood diseases are taught.

Essential content
- The nature of genetic disorders in humans
- Mendelian disorders
- Multigene diseases
- Cytogenetic diseases
- Single gene diseases with atypical inheritance
- Childhood diseases, including congenital anomalies
- Perinatal Infections
- Respiratory Distress Syndrome (RDS)
- Sudden Infant Death Syndrome
- Fetal hydrops
- Tumor and tumor-like lesions in children
- Molecular diagnosis of genetic diseases

Pathology training can be integrated into independent training packages while retaining the university curriculum's approved content titles and training hours.

**E) Pathology of nutritional and infectious environmental diseases**

In this course, the student must study the pathology of environmental diseases, understand malnutrition and infection.

In this course, genetic disorders, environmental diseases, malnutrition, and infections are taught

**Environmental diseases and malnutrition (4 hours)**
- Harmful and toxic physical and chemical agents
- Environmental pollutants
- tobacco
- alcohol
- Abuse of drugs
- Injury by physical damages
- Nutritional diseases (including malnutrition, vitamin deficiency, obesity, overeating, and anorexia nervosa)

**Infectious diseases (2 hours)**
- General principles of microbial pathogenesis
- Specific techniques for identifying infectious agents
- New and emerging infectious agents
- Bioterrorism agents
- Mechanism of viral and bacterial damage
- Germs escape from the immune system
- The extent of the inflammatory response to infectious agents

Pathology education can be organized and integrated into independent educational packages while preserving the titles, content, and educational hours approved in the university curriculum.

# Practical pathology

General Objectives:

• Familiarity with the pathology laboratory, its working methods, reception and preparation of samples, and archiving

• Identify the types of samples tested and sampling methods and sample evaluation in the pathology laboratory

• Knowing the correct way to submit different types of clinical samples to the pathology laboratory

• Ability of the clinical physician to communicate with the laboratory

Core Syllabus and Essential contents:

This lesson includes the basics, the correct general processes and methods of clinical work related to the pathology laboratory and identifying the main types of clinical specimens.
- Familiarity with the pathology laboratory, how it works, reception and preparation of samples, and archiving
- Sampling methods and evaluation of samples in the pathology laboratory
- The correct way to send all types of clinical samples to the pathology laboratory and the clinical physician's relationship with the laboratory
- Identify, describing and differentiate following tissue samples, including following slides:

1- Squamous metaplasia
2- Acute purulent inflammation with caseous necrosis
3- Chronic non-specific inflammation
4- Granulomatous inflammation with caseous necrosis (tuberculosis)
5- Coagulation necrosis
6- Fat accumulation in the liver
7- Accumulation of melatonin
8- Calcium deposition
9- Xanthelasma (aggregation)

10- Wound and granulomatous tissue
11- Scar or keloid
12- Tissue hyperemia
13- Thrombus
14- Infarction
15- Allergic inflammation
16- Amyloid deposition
17- adenomas
18- Papilloma
19- Osteochondroma
20- Lipoma
21- Adenocarcinoma
22- Squamous cell carcinoma
23- Sarcoma
24- Lymphoma
25- Teratoma (three layers of the fetus)
26- Plasmacytoma
27- Polyps
28- Dysplasia and carcinoma in situ
29- Metastasis
30- Cystic lesions
31- Hydatid cyst
32- Pap smear
33- An immunohistochemical sample
34- A cytology sample

35- parasitic disease (Aspergillus, Mucor mycosis, Leishmaniasis, etc.)

**COURSE NAME:** Introduction to Religion I & II
**NUMBER OF CREDITS:** 4.0 (theory) (in two courses)
**COURSE TYPE:** Theoretical

**GENERAL AIMS**

The attempt to introduce the true and scientific knowledge of three great and divine religions: Judaism, Christianity and Islam, and the proof of the legitimacy of the religion of Islam as well as the religion of the Ahlul-Bayt (as).

**COURSE DESCRIPTION**

First reviewing the preliminary discussion of generalities and definitions such as religion and its definition or law and its definition, prophets and their holy books. In addition, history of religions such as Judaism, Christianity and Islam will be discussed. Finally, it provides a brief overview of the content of these religions, issues such as the concept of God, the Day of Judgment, the monotheism (توحید), justice (عدل), Prophecy (نبوت), divine leadership (امامت), and the Day of Judgment (معاد) holy books and predictions about the final prophet.

**CONTENT**

1. Definition of the lexical and terminology of religion
2. Why should he believe in religion? What are the benefits and functions of religion?
3. Psychological functions of religion / Cognitive functions of religion
4. Ethical and social functions of religion
5. What Prophets are the Prophets?
6. . Introducing divine religions (Christianity, Judaism, Islam)
7. The revelation of the first revelation
8. Non-public propaganda as well as public publicity of religion
9. The story of Hadith Yum Eldar According to the famous historian, Tabari
10. Immigration to Medina and the Adventures of the Layla Almabit and Fazilat (Text in Persian) Amir al-Momenin Ali (AS)
11. Which religion is true and right?
12. What is the meaning of religious pluralism? Is this thinking correct and correct?
13. What is the Quran's comment on religious pluralism?
14. Why do we say that the religion of Islam is the most complete religion and religion is right?
15. If everyone is required to follow the religion of Islam, what is the duty of followers of other religions? Are they rescued or not?
16. What is basically the criterion of a true religion? What indicators make us deny a religion and the other religion?

**ASSESSMENT METHOD**

1. Class Participation & Group work 50%
2. Final exam (written) 50%

**COURSE NAME:** Islamic Revolution of Iran
**NUMBER OF CREDITS:** 2.0 (theory)
**COURSE TYPE:** Theoretical

**GENERAL AIMS**

This course explores the making of the Iranian Revolution of 1978-79 and the subsequent establishment of the Islamic Republic. Framed in a comparative perspective, it explains the cultural and political peculiarities that shaped the Islamist outcome of the Revolution This course provides an in depth introduction to the modern history of Iran with a focus on the cultural and political factors that culminated in the 1979 revolution.

**ASSESSMENT METHOD**

1. Class Participation 30%
2. Assignment 20%
3. presentation 50%

**COURSE NAME:** Divine Texts
**NUMBER OF CREDITS:** 2.0 (theory)
**COURSE TYPE:** Theoretical

**GENERAL AIMS**

Acquaintance with ancient conceptions of the divine in various contexts. This course serves as an introduction to the revelation of God and our response of faith. We explore the transmission of revelation and the dynamism of the adventure of faith. This course promotes personal reflection and holistic formation in participants.

**ASSESSMENT METHOD**

1. Class Participation 50%
2. presentation 50%

**COURSE NAME:** Divine Ethics
**NUMBER OF CREDITS:** 2.0 (theory)
**COURSE TYPE:** Theoretical

**GENERAL AIMS**

The attempt to introduce the true and scientific knowledge of three great and divine religions: Judaism, Christianity and Islam, and the proof of the legitimacy of the religion of Islam as well as the religion of the Ahlul-Bayt (as).

**COURSE DESCRIPTION**

This course is designed to familiarize students with the principles and concepts of Divine ethics in the field of moral virtues and vices, virtues and in order to avoid Moral vices. The belief that what's moral and what's immoral is commanded by the divine the theory asserts that what is moral is determined by what God commands, and that for a person to be moral is to follow his commands. Followers of both monotheistic and polytheistic religions in ancient and modern times have often accepted the importance of God's commands in establishing morality.
The theory asserts that good actions are morally good as a result of their being commanded by God, and many religious believers subscribe to some form of divine command theory.

**CONTENT**

1- The issue of ethic.
2- The literal and technical meaning of ethic
3- Characteristics in our soul
4- The sciences of Ethics. What is the definition?
5- The importance of ethics implementation
6- The moral manners of learning/Teaching
7- The ethic of criticizing
8- Ethics of Life and Working
9- Caring about the affairs and problems of the people
10- Knowing the good and evil properly
11- What is the Quran's comment on Ethics?

**ASSESSMENT METHOD**

1. Class Participation & Group work 50%
2. Final exam (written) 50%

**COURSE NAME:** Physical Training I
**NUMBER OF CREDITS:** 1.0 (practical)
**COURSE TYPE:** Practical

## GENERAL AIMS

Physical education is an important part of pedagogy which eases the growth process in all dimensions of human via movement and exercise (generally, the purposes of physical education are met in movement) and it helps developing the interested talents. Broadly speaking, training and developing the body is done through physical movement and watching moral characteristics.

## CONTENT

**1-** physical fitness and its ingredients
**2-** How to develop some factors of physical fitness?
**3-** Chapter three: Understanding energy mechanism
**4-** Immunity and hygiene in sports
**5-** Knowing the correct daily movements

## ASSESSMENT METHOD

1. Class Participation
**2.** Physical assessment test

**COURSE NAME:** Physical Training II
**NUMBER OF CREDITS:** 1.0 (practical)
**COURSE TYPE:** Practical
**PREREQUISITES:** Physical Training I

**GENERAL AIMS**

Teaching and practice in more advanced level one of the field of sport for International students

**CONTENT (type of Sport)**

**1-** Fixed Targets Shooting
**2-** Badminton
**3-** Futsal (Indoor Football)
**4-** Basketball

**ASSESSMENT METHOD**

1. Class Participation

Physical assessment test

**COURSE NAME:** General English Language
**NUMBER OF CREDITS:** 3.0 (theory)
**COURSE TYPE:** Theoretical

Those students who obtain an English proficiency test result such as IELTS or TOFEL can be exempt from taking this course based on their overall score and International College of TUMS decision. Otherwise, the students should cover English course at above- mentioned college.

**COURSE NAME:** General Persian Language
**NUMBER OF CREDITS:** 3.0 (theory)
**COURSE TYPE:** Theoretical

Those students who knew Farsi and pass the TUMS International college placement test can be exempt from taking this course based on their overall score and International College of TUMS decision. Otherwise, the students should cover Farsi course at above- mentioned college.

**Basic Persian Writing**: in this course, students will learn the Persian language alphabet and learn how to read, write and pronounce the Persian words.
**Persian Paragraph Writing**: in this course, students will be familiarized with the structure of a Persian paragraph and will practice writing different types of paragraphs in Persian.
**Persian Essay Writing**: this course will familiarize students with the process and structure of writing essays in Persian. Students will practice developing and writing different types of essays in Persian.

As in the case of Persian Free Discussion classes, attending these writing courses is optional.

**COURSE DESCRIPTION**

- The student has to be able to ask the patient about identification data in Persian (Age, gender, job, marital Status).
- The student has to be able to ask in Persian about the patient's main complaint that causes him to refer to the hospital or to the doctor's office.
- The student has to be able to duly express the most common disorders in Persian
- The student has to be able to ask about the most common complaints of the common disorders in Persian.
- The student has to be able to ask in Persian about 7 aspects of each clinical symptom as the main complaints of the patient (including: locus, quality, quantity or intensity, onset, duration & frequency, conditions of symptom exposure, intensive or palliative factors.
- The student has to be able to ask about Accompanied (Associated) Manifestations in Persian.
- The student has to be able to ask about the past history of the common disorders in Persian.
- The student has to be able to ask about the patient's childhood diseases in Persian.
- The student has to be able to ask about the patient's previous surgeries and their cause and time in Persian.
- The student has to be able to ask about the patient about the consumption of Cigarette, alcohol and narcotic drugs in Persian.
- The student has to be able to ask in Persian about the patient's family history of common disorders.

**ASSESSMENT METHOD**

Presenting Teamwork

2nd Stage:
**physiopathology Courses**
**(Clinical preparations)**
**Doctor of medicine Curriculum**

Basic Clinical Skills Lab:

Basic Clinical Skills Lab consist of three parts:

2-2-1: including educational videos showing physical examination which are presented virtually in 6 beginning sessions of Physiopathology 2 semester.

During the second semester, in the afternoons, students are divided into groups with 20 members and practice physical examinations on their classmates, mannequins or patients, etc. in Skill lab under the supervision of professors from internal medicine department.

Students in groups of 8 to 10 are introduced as pre-ceptorship to the professors of internal medicine ward and continue their practice in the educational and medical centers. They learn taking history and doing physical examination in the hospital environment. Apart from taking history and doing physical examinations, students also learn all the principles, medical ethics, Medical Rituals and human disciplines as well as communication skills as a competent physician.

2-2-2- pathophysiology courses include gastrointestinal, cardiovascular (each one for four weeks), endocrinology and metabolism, nephrology, hematology, rheumatology, and pulmonary courses (each lasting three weeks) combined with pharmacology, advanced pathology, Immunology and semiology, which are taught for six months as follows:

A - After that, the students receive semiology training in clinical wards, once a week in the morning, and undergo the pathophysiology course up to 12 hours weekly.

B- During 12 months of advanced pathology and pharmacology courses taught simultaneously.

It is recommended that these courses be taught simultaneously or after the physiopathology of the relevant system. The order of division of pathology and pharmacology units is the responsibility of the medical school.

2-2-3- At the end of teaching one or two topics in pathophysiology, an exam will be taken. Those who do not get a passing score in the exam will try another exam of those topics at the end of the semester. The re-exam score will be the final score of those topics. If the students do not pass the re-exam, they will be obliged to repeat the topic at the end of the course.

2-2-4- The advanced pathology and pharmacology exams will be held at the end of 6 months together. The decision on midterm exams is up to the respective professors.

2-2-5- Passing all subjects of semiology and physiopathology is necessary for starting the clinical stage. Under extraordinary circumstances, the medical school may allow students who have failed in one of their physiopathology courses to enter the clinical stage. The student must pass the failed exam within a maximum of one semester, and in case of failure, is obliged to repeat the classes of that course.

2-2-6- The maximum time allowed for completion of the second phase is a year and a half.

2-2-7- Before starting the internship, the students should take a three-week healthcare clerkship in the PHC department units affiliated with TUMS.

3rd Stage:

# Clinical Clerkship

**Doctor of medicine Curriculum**

## A: Clinical courses and rotations

| Number | course name | Duration of course | credits equivalent. | Clinical departments included |
|---|---|---|---|---|
| 1 | Internal medicine | 6 months | 18 | Internal medicine (general internal medicine wards),<br>Neurology,<br>Infectious diseases |

Descriptions:

1- The division of course length between different departments is based on the internal planning of the faculty.

2- The time allocated to the internal medicine general department, should not be less than 3 months and the time allocated to other departments should not exceed one month in clerkship stage of the medical students.

| Number | course name | Duration of course | credits equivalent. | Clinical departments included |
|---|---|---|---|---|
| 2 | Surgery | 4 Months | 12 | General surgery,<br>Urology,<br>Orthopedics. |

Descriptions:

1- Adjusting the course length between different departments is based on the internal planning of the faculty.
2- The time of general surgery should not be less than 2 months and the time of other wards should not be more than one month in clerkship stage of the medical students.

## Further Clinical Rotations in clinical clerkship

| Number | course name | Duration of course | credits equivalent. | Clinical departments included |
|---|---|---|---|---|
| 3 | Pediatrics | 3 months | 9 | *In the first 8 months of the clerkship stage, students must take the surgery course and four months of the internal course.<br><br>the remainder of the internal course and other departments. |
| 4 | Gynecology and Obstetrics | 2 months | 6 | |
| 5 | Ophthalmology ** | 1 month | 3 | |
| **6** | **ENT** | **1 month** | **3** | |

| Number | course name | Duration of course | credits equivalent. | Clinical departments included |
|---|---|---|---|---|
| 7 | Psychiatry | 1 month | 3 | will follow after these 8 initial months,<br><br>it is emphasized that the main general internal medicine should be a part of these four months of the internal course. |
| 8 | Radiology | 1 month | 3 | |
| 9 | Dermatology | 1 month | 3 | |
| sum | | 21 Months | 64.5 credits | |

## B: Theoretical courses

in medical clerkship stage

| Course code | Course Name | credits equivalent | Hours | | |
|---|---|---|---|---|---|
| | | | Theory | practical | sum |
| 14-4 | Medical statistics and Research Methodology | 2 | 34 | | 34 |
| 1 | Infectious diseases * | 3 | 51 | | 51 |
| 2 | Neurological diseases** | 2 | 34 | | 34 |
| 3 | Surgical diseases * | 6 | 102 | | 102 |
| 4 | Gynecology and Obstetrics* | 4 | 68 | | 68 |
| 5 | Pediatrics diseases ** | 6 | 102 | | 102 |
| 7 | Psychiatry and Mental disorders ** | 2 | 34 | | 34 |
| 68 | Forensic medicine and toxicology | 2 | 34 | | 34 |
| 14- 5 | Epidemiology of Common Diseases *** | 2 | 34 | | 34 |
| 44 | Medical Ethics | 2 | 34 | | 34 |
| sum | | 32 | 527 | | 527 |

*** Medical statistics and research methodology session are to be held in the afternoons of the first four months of clinical training.**

**** Theoretical courses of ENT, neuropsychology and radiology can be taught in the mornings (in groups) in the relevant clinical sections or in the afternoons collectively for all students.**

**** Theoretical courses of neurosurgery, obstetrics and gynecologists, pediatrics and Psychiatry and Mental disorders are taught in the afternoons of the first 16 months of clinical education.**

**- forensic medicine and epidemiological medicine courses are held in the afternoons of the last four months of clinical education.**

**** Community Medicine Clerkship field rotation in a three weeks' field activity as an "active member of primary health care (PHC) provision", in Healthcare units across Tehran and neighboring county, affiliated with Tehran University of Medical Sciences.**

A - The mornings of the first two weeks of training are assigned to introduce semiology lessons

To obtain the medical doctorate, student must submit an approved and successfully defended doctoral research dissertation in medical sciences.

The Second stage

# Physiopathology stage

## Clinical preparations stage

Core Syllabus

# Semiology
# Clinical History taking and physical examination

**Type: Theoretical-Practical**

**Credits: 4**

**Training hours:** **25 hours Theoretical + 172 hours Practical**

**Skill lab**

The following courses are organized into two theoretical courses and two practical courses. It is recommended that theoretical training and the practical be provided simultaneously if possible.

- Clinical History taking and physical examination (theoretical)
- Clinical History taking and physical examination (practical)

At the end of this course, the student should be able to:

1- Explain the importance and algorithmic steps of establishing a constructive professional relationship with the patient and apply it in practice.

2- Explain the role and position of Clinical History taking and clinical examination in clinical reasoning and patient care decision-making.

3- Explain the relationship between the stages of Clinical History taking and clinical examination with the stages of clinical reasoning (data collection, assessment, and decision making).

4- Explain the general principles of Clinical History taking in special circumstances (patients with special problems, the elderly, children, and the disabled).

5- Explain the principles and rules of documenting the Clinical History and patient‘s medical profile

6- Explain the general principles of a medical brief and complete introduction of the patient and its applications.

General goals and objectives:

1- The role and place of patient Clinical History in decision making in practice
2- Principles of clinical reasoning (data collection, assessment, decision making)
3- General principles of Clinical History taking
4- General principles of communication skills
5- General principles of Clinical History taking in special circumstances:
    Patients with eye and vision problems
    Patients with ear, nose, and throat problems and deafness
    Patients with skin problems
    Patients with musculoskeletal problems
    Patients with neurological problems
    patients with physical injury problems
    mentally-ill patients
6- general principles of Clinical History taking in special circumstances
    elderly
    infants
    children
    disabled people

7- General principles of documentation of Clinical History (Hx writing, complete patient note & brief)
8- General principles of patient introduction (presentation, brief and complete)

In this lesson, the students must achieve the required education goals by attending the classroom sessions, clinical skills learning center (skill lab), attending workshops, by means of teamwork, and personal practice.

The learning activities of this course should be a balanced combination of theoretical training, individual study, group discussion, and other learning assignments.

It is recommended that the practical part of this course be presented simultaneously with the theoretical part and through practice in small groups in the TUMS Clinical Skills Learning

Center or Controlled Clinical Environments, under the direct supervision of faculty members or trained instructors.

Timing and combining these activities and the areas required for each activity (including the Skill Lab classroom and the clinical areas) is determined in the Study Guide following the standards.

* Due to the different conditions of education in different subjects, it is necessary for the learning guide to be compiled and made available to the students by the medical school according to the expected equivalence document of the graduates of the general medicine doctorate course and considering the standards announced by the secretariat of the General Medical Education Council of the Ministry of Health and Medical Education.

** It is necessary to determine, announce and implement the methods and program of education and student evaluation based on appropriate scientific principles by the department. Approval of the program, supervision of the implementation, and evaluation of the program is the responsibility of the medical school.

Core Syllabus

- Basic Clinical history and clinical Examinations
- Semiology and Clinical History of **Cardiovascular Diseases** and Physical Examinations of **Cardiovascular system**
- Semiology and Clinical History of **Pulmonary Diseases** and carry Physical Examinations
- Semiology and Clinical History of **Endocrine and Metabolic Diseases** and Physical Examination of the **Thyroid**
- Semiology and Clinical History of **neurological diseases** and physical examination of **nerves**
- Semiology and Clinical History of **head and neck diseases** and physical examination of **the head and neck**
- Semiology and Clinical History of **Musculoskeletal diseases** and physical examination of **joints**

- Semiology and Clinical History of **Hematologic diseases** and physical examination of **lymph nodes and spleen**
- Semiology and Clinical History of **Gastrointestinal diseases** and physical examination of the **abdomen**.

## Basic history and clinical examinations

- Health history structure and goals
- Health history components
- Comprehensive clinical history of adults
- Date and time of the Clinical History
- Identity and identification
- Confidentiality
- Chief Complaint
  Present illness
- Medication's history
- Allergies and intolerabilities (Medications and food)
  Past medical History
- Family History
- Social and Personal context History
- Review of Systems

## Physical examinations and general algorithmic approaches

- general comprehensive Physical examination
- Specific Examinations (in each system and organ)

  *core essential organ specific examinations and signs are listed in MoH&ME Semiology booklet

A) Describe and apply the following:

1. The role and place of clinical examination in clinical reasoning
2. General principles of physical examination
3. General principles of examinations related to vital signs

4. General principles of examinations related to the patient's appearance and skin findings

General appearance

Skin manifestations

5. General principles of head and neck examinations
6. General principles of ophthalmologic examination
7. General principles of ENT examinations
8. General principles of cardiac examinations: normal, murmurs
9. General principles of respiratory examinations
10. General principles of abdominal and rectal examination
11. General principles of joint and muscle examinations and rheumatology
12. principles breast examination
13. General principles of gynecological and obstetric examinations
14. General principles of urological examination

B) Recognize and observe
cultural, ethical, and religious considerations about examinations of specific areas of the body.

At the end of this course, the student should be able to:

Perform the physical examinations of the following devices and organs on the model or the standardized patient:

1. Measure and record vital signs
2. Examinations of the patient's appearance and skin findings

general appearance

skin manifestations

3. Head and neck examinations
4. Ophthalmologic examination
5. Ear, nose, and throat examinations
6. Cardiac examinations: normal, murmurs
7. Respiratory system examinations
8. Abdominal examination
and rectal examination
9. Joint, muscle, and rheumatologic examinations
10. Breast examination

11. Obstetrics and gynecology examinations
12. Urological examinations

(Recognize and observe cultural, ethical, and religious considerations about examinations of specific areas of the body.)

# Advanced pathology

**Course Type: Theoretical-Practical**

**Credits: 6**

**Prerequisite: general pathology**

**Training hours: 68 hours Theoretical- 68 hours Practical**

## Pathology of the Cardiovascular System

In this course, the student should be familiar with common diseases and tumors of the cardiovascular system and diagnose the patient's disease based on his knowledge.

General objectives

In this course, the etiology of pathogenesis and clinical manifestations of common diseases and cardiovascular tumors are taught.

Core Syllabus

1- Structure and function of blood vessels

2- Vascular tumors and types of vasculitis

3- Atherosclerosis

4- Clinical consequences of atherosclerosis

5- Aneurysms

6- Ischemic heart disease and congestive heart failure

7- Endocarditis, myocarditis, and pericarditis

8- Cardiac tumors

Essential slides of the practical section:

1- cardiac **Myoma**

2- One of the common types of **hemangioma**

3- One of the common types of **vasculitis**

4- **Atherosclerosis**

## Pathology of the Respiratory System

In this course, the student should be familiar with common diseases and tumors of the respiratory system and diagnose the patient's disease based on his knowledge.
General goals
In this course, the etiology, pathogenesis, morphology, clinical manifestations of common respiratory diseases and respiratory tumors are taught.

Core Syllabus

- atelectasis
- Acute lung injury
- Obstructive lung diseases
- Chronic interstitial diseases
- Vascular diseases
- Lung infections
- Lung tumors
- Pleural lesions
- Upper respiratory tract lesions

**Essential slides of the practical** section:

Lung:

1- Lung **tuberculosis**

2- **Hydatid cyst**

3- **Small cell carcinoma**

4- Other lung carcinomas such as **adenocarcinoma or SCC**

Nasal:

1- **Nasal polyp**

2- A fungal lesion such as **Aspergillus or Mucormycosis**

## Pathology of the kidneys and urinary tract

In this course, the student should be familiar with common diseases and tumors of the kidneys and urinary tract and diagnose the patient's disease based on his knowledge.

General goals

In this course, the etiology, pathogenesis, morphology, clinical manifestations of common kidney and urogenital diseases and tumors are taught.

Lesson description

1- Clinical manifestations of kidney diseases

2- Glomerular disease and its mechanism

3- Nephrotic syndrome

4- Nephritic syndrome

5- IgA Nephropathy

6- Hereditary nephritis

7- Rapidly progressing glomerulonephritis

8- Tubular diseases - insomnia

9- Interstitial tubular nephritis

10- Kidney vascular diseases (malignant arteriovenous arteriosclerosis)

11- Chronic kidney disease

12- Cystic kidney diseases

13- Tumors

Essential slides of the practical section:

1- Chronic pyelonephritis

2- One of the types of glomerulonephritis

2- Kidney amyloidosis

4- Kidney carcinoma

5- Nephroblastoma

**Pathology of Gastrointestinal disorders**

In this course, the student should be familiar with common diseases and tumors of the gastrointestinal tract and diagnose the patient's disease based on his knowledge.

General goals

In this course, the etiology, pathogenesis, morphology, and clinical manifestations of common gastrointestinal diseases and tumors are taught.

Lesson description

1- Lesions of the oral cavity
leukoplakia, benign and malignant tumors,
Benign and malignant lesions of the salivary glands

2- Esophagus
esophageal varices, esophagitis, Esophageal reflux,
Barrett's esophagus, esophageal tumors

3- Stomach
Inflammatory diseases of the stomach, Neoplastic diseases

4- small and large intestine
Hirschsprung, Diarrheal Diseases, Colon Polyps, Colon Tumors

5- Appendicitis

Essential slides of the practical section:

Salivary gland:

1- Pleomorphic adenoma
2- Cystic adenoid carcinoma

Esophagus: SCC

Stomach:

1- A type of gastritis, preferably with Helicobacter pylori infection
2- Common gastric adenocarcinoma
3- Carcinoma with Signet Ring
4- GIST

Intestine:

1- Celiac disease
2- One of the IBD types
3- Colon adenomatous polyp
4- Intestinal carcinoma
5- Intestinal carcinoid
6- Intestinal lymphoma

## Pathology of liver and biliary ducts diseases

In this course, the student should be familiar with common diseases and tumors of the liver and bile ducts and diagnose the patients' disease based on his knowledge.

In this lesson, the etiology, pathogenesis, morphology, and clinical manifestations of common diseases and tumors of the liver and bile ducts are taught.

Core Syllabus

1- Liver failure
2- Jaundice and cholestasis
3- Cirrhosis
4- Portal hypertension
5- Acute and chronic hepatitis
6- Viral hepatitis
7- Alcoholic and non-alcoholic fatty liver
8- Cholestatic diseases (PBC, PSC)

9- Hereditary metabolic diseases

10- Hepatic abscess

11- Tumors and nodules of the liver

12- Gallbladder diseases

13- Gallbladder cancer

14- Exocrine lesions of pancreas pancreatitis, pancreatic neoplasms

Essential slides of the practical section:

1- One of the types of hepatitis

2- Fat accumulation

3- Cirrhosis

4- Hepatocellular carcinoma

5- Metastasis to the liver

## Pathology of the genital tract, lower urinary tract, and breast

In this course, the student should be familiar with common diseases and tumors of the male genital tract, lower urinary tract, and female genitalia. Students should be able to diagnose the patient's disease based on their knowledge.

General goals
In this course, the etiology, pathogenesis, morphology, and clinical manifestations of common diseases and tumors of the **male genital tract and lower urinary tract, female genitalia, and breast** are taught.

Lesson description

1- Male genitalia and lower urinary tract (2 hours)

- Penis (inflammatory lesions, neoplasms)

- Scrotum, testes, and epididymis

- Prostate

- Ureter, bladder, and urethra

- Pathology of sexually transmitted diseases

2- Female genitalia (6 hours)

- Vulva
inflammatory lesions, non-neoplastic lesions, tumors

- Vagina
Inflammatory lesions of the vagina, malignant tumors, SCC, Adenocarcinoma, Botryoid sarcoma

- Cervix
inflammatory lesions of the cervix, cervical neoplasia, Invasive cervical cancer, endocervical polyp

- Uterine body
endometritis, Adenomyosis, Endometriosis, AUB, Proliferative lesions of the endometrium and myometrium, Endometrial hyperplasia
, Endometrial carcinoma, Endometrial polyps, Leiomyoma, Leiomyosarcoma

- Ovaries
follicular and ovarian cysts, Polycystic ovaries, Ovarian tumors, Superficial epithelial tumors, Serous tumors, Mucinous tumors, Endometrioid tumors

- Pregnancy diseases
inflammation and placental infections, Ectopic pregnancy, Trophoblastic disease

- Pre-eclampsia/Eclampsia

3- Breast diseases (2 hours)

- Fibrocystic changes
- Inflammatory processes
- Tumors
- Breast lesions in men

**Essential slides of the practical pathology session:**

Bladder:

1- TCC
Testicular:
1- Testicular atrophy
2- Seminoma
2- non-seminoma tumor

Prostate:

1- Prostate hyperplasia
2- Prostate adenocarcinoma

Uterus and placenta:

1- Endometrial hyperplasia
2- Uterine myoma
3- Uterine adenocarcinoma
4- Hydatiform mole

Cervix:

1- Inflammation with squamous metaplasia
2- Cervical dysplasia
3- Cervical polyp
4- SCC
5- Pap smear

Ovary:

1- Serous and mucinosis cysts
2- One of the types of ovarian carcinoma
3- Ovarian teratoma

Breast:

1- fibrocystic disease
2- fibroadenoma
3- the typical type of ductal carcinoma
4- the typical type of lobular carcinoma

## Pathology of hematologic and endocrine disorders

In this course, the student should be familiar with common diseases and tumors of the endocrine and breast systems and diagnose the disease in dealing with the patient based on his knowledge.

General goals
In this course, the etiology, pathogenesis, morphology, and the clinical manifestations of common diseases and tumors of the endocrine and mammary glands are taught.

Lesson description

**1- Endocrinology pathologies (6 hours)**

1- Pituitary gland

2- Thyroid

3- Parathyroid gland

4- Endocrine pancreas

5- Adrenal cortex

6- Adrenal medulla

**2- Hematologic diseases (6 hours)**

1- Erythrocyte disorders

iron deficiency anemia. Vitamin deficiency anemia, megaloblastic anemia Aplastic anemia, Anemias associated with bone marrow disease, Hemolytic anemias, Thalassemia minor and major, Sickle cell anemia

2- white blood cell disorders

3- disorders related to spleen and thymus

splenomegaly, benign and malignant lesions of thymus

Essential slides of the practical part:

Thyroid:

1- Nodular goiter

2- Hashimoto's disease
3- Thyroid adenoma
4- Papillary carcinoma
5- Medullary carcinoma

Adrenal:
1- pheochromocytoma
2- neuroblastoma

Lymph node:
1- Tuberculosis
2- One of the types of Hodgkin's lymphoma
3- One of the types of non-Hodgkin's lymphoma

Bone marrow:
1- One of the types of acute leukemia
2- One of the types of chronic leukemia
2- Multiple myomas

Peripheral blood smear
normal and anormal variations and disorders

## Pathology of skin diseases and musculoskeletal system

1. Acute and chronic inflammatory dermatosis, vesiculobullous diseases, pemphigus, pemphigoid, herpetiform dermatitis, benign and malignant skin lesions

2- Bone diseases
- Congenital disorders of bone and cartilage
- Acquired bone diseases
- Osteomyelitis
- Bone tumors

3- Joint diseases
- Arthritis
- Joint tumors and quasi-tumor lesions

4- Soft tissue diseases
- Soft tissue tumors and their types

Essential slides of the practical part:

dermatology:
1- One of the common inflammatory diseases such as lichen planus or psoriasis
2- A vesicular lesion like pemphigus
3- Warts
4- Seborrheic keratosis
5- Melanocytic nevus
6- Melanoma
7- BCC
8- SCC

Bone:
1- Chondroma and Chondrosarcoma
2- Osteochondroma
3- Osteosarcoma
4- Ewing Sarcoma

Soft tissue:
1-One of the types of benign tumors such as lipoma or fibroma
2- Schwannoma
3- Fibromatosis
4- One of the typical types of sarcomas

**Pathology of the central and peripheral nervous system**

In this course, the student should be familiar with common diseases and tumors of the central and peripheral nervous system

General goals

This course teaches the pathology of morphology and clinical manifestations of common diseases and tumors of the central and peripheral nervous system.

Lesson description

1- Nervous system damage

2- Cerebrovascular disease

3- Nervous system infections

4- Primary myelin disease

5- Neurodegenerative diseases

6- Tumors

7- Familial tumor syndromes

8- Peripheral nerve disorders

10- Nerve and muscle function injury

11- Benign and malignant tumors of peripheral nerves

12- Skeletal muscle disorders

Essential slides of the practical section:

1- Astrocytoma
2- Meningioma
3- Ependymoma

# Pharmacology

**Type: Theoretical-Practical**

**Credits: 4**

**Prerequisite: Immunology**

**Training hours:** **60 hours Theoretical + 17 hours Practical**

At the end of this course, the student should acquire knowledge and understanding of each of the basic concepts of pharmacology and relate these concepts to the pharmacological effects of drugs and the use of specific drugs in systems pharmacology.

In this course, the student will be introduced to the basics and concepts of pharmacology, including the kinetics and dynamics of drugs. As an introduction to the pharmacology of systems, they will be introduced to the drugs of the autonomic system.

## Pharmacology principles

Principal Definitions in Pharmacology,

Information sources in pharmacology and pharmaceutical information,

Nature and characteristics of drugs (molecular size and weight, drug junctions),

Principles of pharmacodynamics (receptors and other drug binding sites),

principles of pharmacokinetics (familiarity with absorption, distribution, metabolism, and disposal),

the process of production and approval of new drugs (safety and efficacy, animal experiments, clinical trials, drug exclusiveness, new drugs rules and regulations)

## Pharmacokinetics:

Effective drug concentration,
distribution volume, clearance, half-life,
bioavailability, drug excretion,
rational regimen for prescribing drugs,
therapeutic range, dosage adjustment in cases of excretion disorders,
metabolism of drugs (types, indicators of determining the speed of metabolism),
the correct method of consumption and comparison between solid and liquid drug forms,
(injectable products, inhaled products),
topical products (skin, eye, nose, ear, rectal, and vaginal)

## Pharmacodynamics:

Definition of the receptor and the effector of the drug,
the nature of the receptors, other drug sites,
interactions of drugs with the receptors,
classification of drugs based on their effect on receptors,
definition and comparison of drugs regarding intrinsic activity and affinity,
Quantitative comparison criteria (ED50, potency, efficacy),
graded dose-response curves,
definition and comparison of agonists, antagonists, partial agonists, inverse agonists,
Competitive and non-competitive antagonists,
pharmacological antagonists, chemical and physiological antagonists,
quantal dose-response curves, Criteria for comparing the safety of drugs (LD50, TD50,
therapeutic index, certain safety factors),
receptors modifications,
interpersonal changes and types of this change in response to medication,
acceptance of treatment (adherence, compliance, and concordance),
tolerance and tachyphylaxis,
therapeutic effects and adverse drugs reactions (side effects, toxicity, idiosyncrasy,
accumulation, tolerance, allergy),
pharmacogenetics and pharmacovigilance

* All definitions, concepts, and comparisons will be explained with examples of medications.

## Basics of the autonomous nervous system:

Comparison of autonomic system with sensory and motor nerves, classification of autonomic nerves (neural ganglia, preganglionic and postganglionic fibers), message transmission in cholinergic and adrenergic nerves (storage, release, and termination of the effect), general mechanisms of action of drugs affecting the production, storage, release, and termination of the effect of parasympathetic and sympathetic systems, types of cholinergic and adrenergic receptors and their distribution and function in different tissues
, stimulation of parasympathetic and sympathetic systems on body organs and their interactions, locations and the modifications of the autonomic nervous system, accompanying or auxiliary transmitters (co-transmitters), details of the function of the autonomic cardiovascular nerves in regulating mean arterial pressure, in the eye, and in the intestine (as the important examples)

## Cholinergic receptor stimulants and anticholinesterases:

Classification of cholinergic drugs (cholinomimetics), main clinical applications of direct-acting parasympathetic drugs (such as bethanechol and pilocarpine), indirect-acting cholinergic drugs including clinical applications, adverse effects, and toxicity, precautions, and differences of these drugs (such as Edrophonium, Physostigmine, Tacrine,
Rivastigmine, etc.), available pharmaceutical products from this group of drugs.

## Antagonists of muscarinic receptors and nicotine cholinergic receptors:

Category, clinical applications, adverse effects, and toxicity, precautions, differences of these drugs, pharmaceutical products from this group of drugs

## Sympathomimetic drugs:

Classification, clinical applications, adverse effects, toxicity, precautions differences between these drugs, and pharmaceutical products available from this group of drugs

## Sympathetic receptor blockers:

Classification, clinical applications, adverse effects, toxicity, precautions, differences between these drugs, and pharmaceutical products available from this group of drugs

## Pharmacology of Cardiovascular and respiratory systems

10 hours

The student should be able to:

1- Name the drug groups used in common diseases of the cardiovascular system and lungs (according to the course topic) and pharmacological properties (method of absorption, distribution, metabolism, excretion, and the effects of the drug on various organs of the body) in the case of top drugs, or describe the high-consumption medications of each group

2- Pay attention to the serious effects and important side effects of the drugs used in common diseases of the cardiovascular system

3- Considering the speed of scientific developments and the findings of clinical trials on introducing new drugs and determining the uses or side effects of cardiovascular and respiratory drugs, note the importance of reading the latest guidelines and evidence for use before prescribing these drugs

In this course, students will become familiar with drug groups used in common diseases of the cardiovascular system and lungs, and become familiar with the pharmacokinetic and pharmacodynamic properties of these drugs, and observe examples of changes in guidelines for the use of these drugs resulting from the new evidence in clinical trials.

Drug groups used in hypertension and widely used drugs from each group:

- Vasodilators and treatment of angina
- Effective drugs in heart failure
- Antiarrhythmic drugs
- Diuretics (Carbonic anhydrase inhibitors, thiazides, diuretics affecting the Henle loop, other)
- Drugs used in the treatment of hyperlipidemia
- Bronchodilators and other drugs used in asthma, allergic rhinitis, cough

## C) Pharmacology of antimicrobial drugs

10 hours

The student should be able to:

1- Name the drug groups affecting infectious diseases (according to the course title) and the pharmacological characteristics (method of absorption, distribution, metabolism, excretion, and effects of the drug on different organs of the body) in the case of leading or widely used drugs from each group.

2-Pay attention to the dangerous effects and important side effects of drugs effective on infectious diseases

3- Considering the pace of scientific developments and the findings of clinical trials on introducing new drugs and determining the uses or side effects of drugs affecting infectious agents, pay attention to the importance of studying the latest guidelines and evidence on consumption before prescribing these drugs.

In this course, the students will be introduced to "drug groups affecting infectious diseases" and the pharmacokinetic and pharmacodynamic properties of these drugs. They will see examples of changes in the guidelines for using these drugs due to new evidence in clinical trials.

- Penicillins and cephalosporins
- Aminoglycosides
- Sulfonamides and Trimethoprim
- Fluoroquinolones
- Chloramphenicol and tetracyclines, and macrolides
- Antimycobacterial drugs
- Antiviral drugs
- Anti-protozoan and anti-worm drugs
- Miscellaneous drugs and topical disinfectants

Antimicrobial resistance principals

algorithmic approach to management of resistant bacterial strains

applied clinical assessments

General considerations in practice

Indications and contraindications o newly-developed antibiotics administration

## D) Pharmacology of Blood Gastroenterology and Rheumatology

10 hours

The student must read at the end of this lesson:

1- Name the drug groups in common diseases of the gastrointestinal tract, blood, and connective tissue (according to the course topic) and describe the pharmacological properties (absorption, metabolism, excretion, and the effects of the drug on different organs of the body) in the case of the leading or most widely used drugs of each group

2- Pay attention to the serious effects and important side effects of drugs used in common diseases of the gastrointestinal tract, blood, and connective tissue

3- Considering the speed of scientific developments and the findings of clinical trials on introducing new drugs and determining the uses or side effects of gastrointestinal drugs, hematology, and rheumatology, note the importance of studying the latest guidelines and evidence for use before prescribing these drugs

In this course, students will become familiar with drug groups used in common diseases of the gastrointestinal tract, blood, and connective tissue and the pharmacokinetic and pharmacodynamic properties of these drugs and see examples of changes in the guidelines for the use of these drugs due to new evidence in clinical trials.

- Drugs used in the treatment of peptic diseases
- Gastrointestinal stimulants, effective drugs in the treatment of constipation, antidiarrheal drugs
- Antiemetic drugs
- Drugs used in blood coagulation disorders
- drugs for anemia
- General concepts of chemotherapy
- Non-steroidal anti-inflammatory drugs (NSAIDs), anti-rheumatic drugs, non-opioid analgesics, and anti-gout drugs

## Endocrine Pharmacology

Clinical preparations for internships
Basic principles of medical pharmacology
Theoretical
4 hours
The student should be able to:

1- Name the drug groups affecting the endocrine system (according to the course topic) and the pharmacological characteristics (method of absorption, distribution, metabolism, excretion, and effects of the drug on different organs of the body) in the case of top-leading or high-consumption drugs from each group.

2-Pay attention to the serious effects and important side effects of drugs affecting the endocrine system

3- Considering the speed of scientific developments and the findings of clinical trials on introducing new drugs and determining the uses or side effects of drugs affecting the endocarp device, pay attention to the importance of studying the latest guidelines and evidence on consumption before prescribing these drugs.

In this course, students will become familiar with drug groups affecting the endocrine system. They will become familiar with these drugs' pharmacokinetics and pharmacodynamic properties and observe examples of changes in the guidelines for the use of these drugs resulting from new evidence in clinical trials.

- Hypothalamic and pituitary hormones (analogs and antagonists)
- Thyroid hormone and antithyroid drugs
- Relevant corticosteroids and antagonists
- Sex hormone-related drugs, hormonal contraceptives
- Pancreatic hormones and anti-diabetic drugs
- Drugs affecting bone mineral homeostasis

## E) Pharmacology of neuropsychiatric drugs

4 hours

The student should be able to:

1- Name the groups of drugs affecting the nervous system (according to the course topic) and the pharmacological characteristics (method of absorption, distribution of metabolism,

excretion, and effects of the drug on different organs of the body) in the case of leading or high-consumption drugs from each group.

2- Pay attention to the serious effects and important side effects of drugs affecting the nervous system.

3- Considering the pace of scientific developments and the findings of clinical trials regarding the introduction of new drugs
, their applications, and side effects of drugs affecting the nervous system, pay attention to the importance of reading the latest guidelines and evidence about using them before prescribing these drugs.

In this course, students will become familiar with drug groups affecting the nervous system. They will also become familiar with the pharmacokinetic and pharmacodynamic properties of these drugs and see examples of changes in the guidelines for using these drugs as a result of new evidence in clinical trials.

Drugs affecting the nervous system:

- Antiepileptic drugs
- General anesthetics
- Topical anesthetics
- Skeletal muscle relaxants
- Effective drugs in Parkinson's and other movement disorders
- Narcotic/opioid drugs

Psychiatric medications:

- Sedatives
- hypnotics
- Antipsychotic drugs and lithium
- Antidepressants

# Physiopathology stage Systemic courses

## Preclinical preparation stage

Tehran University of Medical Sciences

Faculty of medicine

Pediatric department

# Curriculum-
# pathophysiology course
# Clinical Preparation Course

In The name of Allah

**Planning committee of**
**pathophysiology course (Clinical Preparation) Course**
**Committee members:**

1. Dr. Emadi, vice –president of internal medicine faculty of education department
2. Dr. Safavi, Faculty member of internal medicine education department- Imam Khomeini Hospital & Amir Alam Hospital
3. Dr. Rahpour, faculty member of pharmacology education department
4. Dr. Jahanzad, Director of pathology education department
5. Dr. Ejtemaei Mehr , director of pharmacology education department
6. . Mrs. Mahjoub, faculty member of education department-pathology
7. Dr. Manoucher Amini, Faculty member of internal medicine education department- Shariati hospital, & Sina hospital
8. Dr. Najafizadeh , faculty member of internal medicine education department- Imam Khomeini Hospital & Amir Alam Hospital
9. Dr. Afshari, compiling authority of case discussions
10. Dr. Labaf, head of clinical skills center of the internal medicine faculty
11. Mirzazadeh , director of faculty of education development & manager of basic clinical practice office
12. Mrs. Dr. Tahereh Naseripour , office of education development faculty – Research expert

## Pathophysiology committee

### Members of the committee:

1. Dr. Khalvat, Director of education department, Internal medicine, Imam Khomeini Hospital& Amir Alam and supervisor of internal medicine pathobiology Rheumatology departments of Imam Khomeini hospital & Amir Alam Hospital
2. Dr. Akbarian, director of internal medicine education department, Dr. Shariati hospital, & Sina Hospital
3. Dr. Sharifian, internal medicine, supervisor of pathophysiology & blood diseases, Imam Khomeini Hospital & Amir Alam Hospital
4. Dr. Bahar, internal medicine, supervisor of pathophysiology & blood diseases, Dr. Shariati hospital & Sina hospital
5. Dr. Naji, internal medicine department, supervisor of pathophysiology and rheumatology, Dr. Shariati hospital & Sina hospital
6. Dr. Pajouhi , internal medicine department, oncology & metabolism, Dr. Shariati hospital & Sina hospital

7. Dr. Nakhjavani, internal medicine department , supervisor of pathophysiology of oncology diseases & metabolism- Imam Khomeini hospital & Amir Alam hospital
8. Dr. Kamal Hedayat, supervisor of cardiovascular pathobiology – Dr. Shariati hospital
9. Dr. Rahmani, supervisor of cardiovascular pathobiology- Imam Khomeini (Rah) hospital
10. Dr. Nasiri Tousi, internal medicine department supervisor of pathophysiology of digestive diseases- Imam Khomeini hospital & Amir Alam hospital
11. Dr. Bagheri, internal medicine department supervisor of pathophysiology of digestive diseases-Dr. Shariati hospital& Sina hospital
12. Mrs. Dr. Sadadi, internal medicine department supervisor of renal pathophysiology – Dr. Shariati hospital, &Sina hospital
13. Dr. Seifi, internal medicine department supervisor of renal pathophysiology- Imam Khomeini hospital & Amir Alam hospital
14. Dr. Dafavi, representative of basic clinical practice, planning committee
15. Najafi Zadeh, representative of basic clinical practice, planning committee
16. Dr. Manouchehr Amini, representative of basic clinical practice, planning committee
17. Dr. Afshari, representative of basic clinical practice, planning committee and supervisor of case discussions
18. Dr. Mirza Zadeh, education development manager of the faculty and director of clinical practice office
19. Mrs. Dr. Tahereh Naseripour , office of education development faculty – Research expert

## Basics of clinical practice curriculum

### General Objective:

The general objective of basics of clinical course is to prepare medical students to enter the clinical course. The course includes pathology, pathophysiology, clinical presentations, principles of basic clinical skills, including: communication skills, physical examination and attaining case history skills, diagnosis and disease prevention, basics of treatment pharmacology and general treatment principles of adults' critical and common diseases Although there are extensive topics for discussion, but the course is more focused on the topics related to commonly critical diseases which the internal medicine practitioners are faced, and medical students must necessarily know them when they are entered to the clinical course. The course underscores student's clinical reflection empowerment through utilization of mechanisms of diseases, effectiveness mechanism of the drugs, and patients 'care principles.

**Scopes of education:**

It is expected that the student be competent and qualified enough at the end of related courses to the organ –system of pulmonary disease, cardiovascular diseases, hepatitis and digestive diseases, concerning rheumatology, blood, renal , oncology and metabolism diseases.

## Knowledge:

1. To recognize the damaged tissues of organ- or the above mentioned systems related to the disease.
2. To comprehend why and how pathogenic factors impact on the natural organs.
3. To perceive the definitions and to know terminology of the diseases
4. To recognize clinical epidemiology of each organ or system
5. To perceive main clinical presentations of the above mentioned organs or systems
6. To comprehend diagnosis principles , to prevent main disorders of related organs or systems , and prevent them
7. To recognize basics of pharmacological treatment or the organs and systems

## Skill:

1. To be competent and qualified enough to attain comprehensive case history, to do examination properly, and orderly, by respecting principles of communication with adult subjects , to record them and represent them as well
2. To be competent and qualified enough to analyze a clinical issue based on the basic sciences and pathophysiology so that he or she takes a proper diagnosis decision and effective patient's care.

## Attitude:

1. To perceive how knowledge of basic sciences and disease pathophysiology is significant in the analysis of clinical issues for diagnosis of the disease and to develop a true treatment plan.
2. To recognize significance of different dimensions of medical sciences and to know how it is necessary for different disciplines to properly cooperate and care the patient.
3. To admit how much important right communication is, how to communicate with patient, and how the effective communication may strengthen relations of patient and the practitioner, and how treatment results are improved.
4. To respect patient and to perceive that practitioner's focus on patient's needs and expectation strengthens his or her relation to the patient.
5. To comprehend that how important patient's case history, punctual and proper care are, and must know and try to improve his or her competencies in this regard.
   Note: Pharmacological, pathology, basics of attaining patient's case history related to other systems, such as nerve and skin are represented henceforth.

**Scopes of education, content, and nine courses:**
**Each one of the named subgroup committees define** the scopes compatible with general objectives of the course.

## Teaching method:

Regarding to the teaching role in curriculum quality improvement, the third stage of basic clinical practice course has specially focused on the curriculum improvement:

1. Although lecturing is the main topic of education, but the main scope is that the students benefit and gain more knowledge from their professors, and their better comprehension of scientific resources.

2. To strengthen their interactive lecturing in this regard, accordingly, the clinical practice office cooperates with the related teaching departments, and the education development office of the faculty to facilitate knowledge

transfer among the faculty members regarding desirable lecturing process and promotion of faculty members' competencies in this regard.

3. Due to the fact that, strengthening the competency and qualifications of problem solving are the defined objectives of the course, meetings for case discussions must be held. Although it is limited in some courses, however number of case discussions must be increased to the formal planning. Planning system must at least include common clinical presentations, consequently, there is a coherent reflection framework for dealing with common diseases.
4. Teaching of main case history attainment method, not only lecturing and multimedia facilities are utilized but also impatient subject in the clinics undergo case history attainment process.
5. Teaching of examination skills includes utilization of multimedia , lecturing, classmate's examination and impatient examinations in the clinic

6. Teaching of communication skills includes teaching of small groups ( discussion and negotiation, film analysis ) interview with standardized patients and interview with impatient subjects in clinics.
7. Due to the meaningfulness of the clinical dealing processes, for the best learning of clinical skills, getting case history, clinical examination and communication, increased cases of clinical dealings, (Patients' presence at clinical wards coordinated with related departments) are emphasized more. Thus, we arranged the planning process so that students could attend rotationally at the clinics in the morning or in the afternoon.

**Evaluation method**

**Student's evaluation**

1. Student's main assessment method includes final term examinations. There is a different between internal medicine students' examination of Imam Khomeini and Amir Alam hospitals; Shariati and Sina hospitals, therefore, we decided that the faculty members develop common questionnaires for the two groups at the end of each term. It is possible due to the same references for both groups.
2. Although multiple choice questions are used for the examination but the questionnaires may include matching questions, as well as short answer explanatory questions. For the first performance of the program the mentioned cases include 30% of the total questions.

3. OSCE test is utilized for the evaluation of clinical skills, getting patient's case history and communication skills.
4. To recognize competency and qualification of case history and examination record, the students' must evaluate case history attainment.

5. The students' competency in problem solving is evaluated by using at least 20 % of the final course questions, high taxonomy questions are asked to evaluate students' competencies in the analysis of the clinical issues.
6. Due to the differently referred viewpoint accomplishment of roll call supported , and there were two main suggestions for implementation guidelines.
    a) In some meetings , attendants' are asked a number of quizzes
    b) Scores of the absent students are reduced the internal medicine education faculty, in this case, the department of medical education faculty is coordinated .

**Course and faculty members' evaluations:**

1. Enrolled individual in each course , the course and faculty members' performances are analyzed by implementation of the survey forms, the students' must answer some questions written on the survey forms.

2. A faculty member of the related department holds a meeting where the students or their representatives are attended. The students' put their ideas about the quality of education and the issues. At the end of a meeting held for case discussion, the students mention their viewpoint. For pharmacology and pathology, the students put their ideas on the quality of education at the end of each term. The education departments' report the decisions taken in the meetings and give their feedback and disseminate the information to the basics of clinical practice office.

3. At the end of each complete basic clinical practice course,(the two semesters), the survey forms are used and centralized meetings are held for analysis of the students detailed ideas.

4. Performances of each group of students and obtained scores of different lessons are compared with those of the previous courses.

5. Faculty members of the education departments are involved in the questioner development process of each course , the developed questionnaires are evaluated then, and the evaluation analysis feedbacks are reported to the questionnaire developers.

6. The obtained evaluation results scores and different methods of evaluations are reported to the concerning departments.

7. Basic clinical practice office, evaluates performances analyses them and sends the evaluation and analysis feedbacks to the education departments.

8. The obtained evaluation results are just utilized for constructive scopes and promotion of the faculty members and so forth.

**Method of information transfer**

1. A guidance manual is issued and distributed among the students to properly recognize objectives of the course, teaching methods and their evaluation system.
2. Basic clinical practice office launched a website for proper information transfer and the students collect their needed information through the website.
3. When the reference is presented, then the students do not need pamphlets, then, they are leaded toward the main resources for their studies, notably, the basic clinical students' level and compatibility of the resources with the students needs and expectations are defined based on the priorities.
4. We decided to formulate a learning handbook and to define authentic references for different lessons, both Harrison's manual of medicine and Seal's essential handbook were offered for more and less important topics respectively. However the handbooks must be compatible with students' level , scopes of the course and the lessons.
5. Proper resources for the students' study and their more comprehension are introduced.

**Course Management**

1. The manager coordinates involved education departments in basic clinical practice , decides on course review, if necessary, the planning committee of basic clinical practice is a subset of the internal medicine planning committee as well.
2. The committee liaise with all involved education departments and faculty of clinical skills.
3. A faculty member of each education department is designated as a supervisor, he or she coordinates with the departments for the students' evaluation and liaise with the basic clinical practice office, departments and wards.
4. Basic clinical practice office directs administration affairs and current affairs within faculty of internal medicine education department.

5. As for , internal medicine education departments of Imam Khomeini, Amir Alam, Shariati and Sina hospitals are involved in basic clinical practice course, and due to the necessity of general compatibility with the scopes, education and evaluation methods among different courses, the pathophysiology committee is established and managers of education departments , supervisors of different education departments as well as representatives of education departments of cardiovascular diseases and the representatives of planning department of basic clinical practice course manage the mentioned processes.

6. The education department and the education groups supervise on the teaching contents of basic clinical practice. Meanwhile, basic clinical practice planning committee supervises on each course, and lessons of pathophysiology, and cardiovascular diseases are supervised by the committee of pathophysiology.

# Physiopathology stage Systemic courses

**Number of credits: 14**

**Unit Type: Theoretical**

**238 hours**

**Prerequisite: Semiology and physical examination**

Syllabus:

The purpose of these courses is to acquaint the medical student with the **physiopatholgical foundations, clinical manifestations, diseases and their contributing factors in an analytical-practical way**. In this section, all information related to diseases is taught based on physiopathology.

Pathophysiology courses include gastrointestinal, cardiology, endocrinology and metabolism, hematology, respiratory, kidneys, and rheumatic disorders.

The internal medicine resources used for the parts of the above books include **Harrison textbook of internal medicine, Cecil textbook of internal medicine, and relevant pathophysiology books recommended by the TUMS professors and faculty members**
in each rotation.
For other parts, the resources listed in the appendix of this document will be used under the supervision of the relevant professors.

Core mandatory Syllabus of training courses are briefly written on the following pages, and the detailed description of the courses can be found in the complement annexed booklet.

# Gastrointestinal diseases

Pathophysiology course

(40 hours)

Core Syllabus

1- Esophagus:

anatomy and histology, physiology
the mechanism of action of swallowing, upper and lower esophageal sphincters,
the principles of the physiopathology of esophageal symptoms
dysphagia, odynophagia, regurgitation
the pathophysiology of diagnosis and treatment of esophagitis,
diffuse esophageal spasm, and changes in collagen diseases and scleroderma

2- Stomach and duodenum:

anatomy and histology, physiology the mechanism of stomach movement and emptying phases, mechanisms of secretions in the stomach, the pathophysiology, diagnosis and treatment of peptic ulcers and duodenal ulcers, Benign and malignant changes, alarm signs, preventions and approach gastritis, drug-induced ulcers, and Zollinger–Ellison syndrome

3- Small intestine:

anatomy and histology, physiology the movements of the intestine, the mechanism of absorption of water, electrolytes, proteins, lipids, carbohydrates, vitamins, iron, calcium, and phosphorus pathophysiology, diagnosis and treatment of malabsorption syndrome dyspepsia syndromes, causes of malabsorption and maldigestion and their differentiation, intestinal parasites, diarrhea, and its mechanism, types of diarrhea (osmotic, secretory, mixed, and

hypermobility), Benign and malignant Tumors, tuberculosis, Whipple, lymphangiectasia, Crohn's disease, closed-loop or microbial growth syndrome, protein-losing enteropathy

4- Colon:

anatomy, histology, physiology defecation mechanism, colonic movements, water and salt absorption, rectal sphincters the pathophysiology of diarrhea, pain and tenesmus, mucus diarrhea and a variety of dysentery, diagnostic approaches, rectorhagia, Benign and malignant Tumors, polyps and polyposis syndromes, diverticulitis, ulcerative colitis and Crohn's disease, Amoeba, tuberculosis, infectious colitis, and irritable bowel syndrome

5- Liver

anatomy and histology physiology the role of the liver in the metabolism of carbohydrates, proteins, and fats; the mechanisms and processes of bile secretion pathophysiology, the diagnosis and treatment of gallstones, metabolism, and the pathogenesis of side-effects of medications in the liver, pathophysiology of jaundice, pathophysiology and diagnostic methods of hepatomegaly, abscesses, Benign and malignant Tumors, Fatty liver changes and staging Hepatitis algorithmic approach to raised liver function tests and hepatic cirrhosis

6- Pancreas:

Anatomy and histology, physiology of the exocrine secretion of pancreas, pathophysiology, diagnosis and treatment of acute and chronic pancreatitis, fibrocystic changes in the pancreas

# Cardiovascular diseases

Pathophysiology course

(40 hours)

Core Syllabus

1- Anatomy, physiology, the electrical activity of heart, cardiac circulation and activity phases, Correlation of electrical activity and physical cardiac activity cardiac nerves, the metabolic regulation of myocardium (In Brief)-

2 hours

2- The clinical manifestations of cardiac diseases, based on physiopathology and clinical examination of patients heart disease

4 hours

3- Chest pain, dyspnea, and its types, palpitations, edema, syncope, cyanosis, the assessment of patients' general condition, the examination of arteries, measuring the blood pressure, Cardiac physical examination, observation, touching, examination of the veins, cardiac auscultation, examination of normal and abnormal heart sounds based on physiology and physiopathology, types of murmurs and their mechanism

8 hours

4- Para-clinical evaluations in the diagnosis of cardiovascular diseases (except electrocardiography)

4 hours

Radiography
Echocardiography
Vectorcardiography
Exercise and stress Test
Holter monitorings of rhythm and arterial pressure
Nuclear Cardiology

4- Principles of normal heart electrophysiology - 3 hours

Concepts of electric wave generation and propagation, rhythm and conduction disorders - blocks - hypertrophies and pacemaker (Briefly)

5- Rheumatic fever 2 hours

Cause - Physiopathology - Symptoms - Diagnosis - Differential diagnosis - Treatment - Prognosis - Prevention

6- Valve heart disease 4 hours

Stenosis and insufficiency of mitral valves, aortic valves, tricuspid, the pulmonary artery - Causes - Physiopathology - Diagnosis - Differential diagnosis - Treatment - Prognosis - Prevention

7- Congenital heart disease: 3 hours

Cardiac embryology, fetal circulation, changes in the blood circulation of the fetus after birth, causes congenital disease, pathophysiology, differential diagnosis, prognosis, treatment, prevention of common types of congenital heart disease (including the atrial septal defect, intraventricular defect, patent ductus arteriosus, Tetralogy of Fallot)

8- Increased arterial blood pressure - 3 hours

Causes - Physiopathology - Diagnosis - Differential diagnosis - Emergencies - Treatment - Prognosis - Prevention

9- Decreased arterial blood pressure, shock, syncope, causes, pathophysiology, diagnosis, differential diagnosis, treatment, prognosis, prevention - 1 hour

10- Coronary artery diseases - 4 hours

Causes of atherosclerosis, risk factors, myocardial metabolism, coronary blood circulation and regulatory factors, the pathogenesis of ischemia, angina pectoris and its types, myocardial infarction, diagnosis, differential diagnosis, complications of treatment, prognosis, prevention

12- Heart muscle diseases - 2 hours

Myocarditis - Cardiomyopathies - Causes - Types - Physiopathology - Diagnosis - Differential diagnosis - Treatment - Prognosis and prevention

12- Heart failure, its types, and emergencies - 3 hours

Causes - Physiopathology - Diagnosis - Differential diagnosis - Treatment - Prognosis and prevention

13 -Pericardial diseases 1 hour

Acute pericarditis - chronic pericarditis and its types - Physiopathology - diagnosis - differential diagnosis - treatment - prognosis - prevention

14- Infectious endocarditis 1 hour

Causes - Physiopathology - Symptoms and signs - Diagnosis - Differential diagnosis - Treatment - Prognosis - Prevention

15- Increased arterial pressure in lungs and heart- 2 hours

Primary and secondary hypertension, pulmonary embolism, pulmonary infarction, causes, pathophysiology, diagnosis, differential diagnosis, treatment, prognosis, prevention

16- Heart and lung resuscitation - 1 hour

17- Arterial diseases 1 hour

Large arteries of their branches: aortitis - Leriche syndrome - Takayasu - aneurysm and aortic dissection
Small arteries: Buerger disease - vasculitis - embolism

Causes - Physiopathology - Diagnosis - Differential diagnosis - Treatment - Prognosis - Prevention

18- Diseases of the veins

Large Veins - Peripheral Veins - Thrombophlebitis - Phlebothrombosis - Varicose Veins - Causes - Physiopathology - Diagnosis - Differential Diagnosis - Treatment - Prognosis - Prevention

# Endocrine diseases and metabolism

(32 hours)

Course Title : 3-51

1- General endocrinology - 1 hour

2- Physiology of the hypothalamus and anterior pituitary - 1 hour

3- Disorders of growth hormone: etiology, the physiopathology of the signs, principles of tests for the diagnosis and treatment of over-and-under secretion of growth hormone - 1 hour

4- Pathophysiology, diagnosis, and treatment of hypopituitarism - 1 hour

5- The etiology, pathophysiology, signs, symptoms, principles of diagnostic tests for hyperprolactinemia, diagnosis, treatment of tumors of the pituitary - 1 hour

6- Posterior pituitary gland: Physiology and regulation of ADH secretion, etiology, pathophysiology, signs, symptoms, principles of tests for the diagnosis and treatment of diabetes insipidus and inappropriate secretion of ADH
- 1 hour

7- Metabolism and regulation of calcium and phosphorus, metabolism and the effects of vitamin D

8- The etiology, pathophysiology, signs, symptoms, the principles of diagnostic tests for hyperglycemia; the diagnosis and treatment of hyperparathyroid
ism

9- The etiology, pathophysiology, signs, symptoms, the principles of diagnostic tests and treatment for hypercalcemia; the diagnosis and treatment of hypoparathyroidism and
osteomalacia

10- Synthesis, secretion, mechanism, regulation of secretion, physiology of thyroid hormones –
1 hour

11- Thyroid function tests - 1 hour

12- Classification of thyroid diseases, pathophysiology, diagnosis, and treatment of simple and endemic goiters - 1 hour

13- Hyperthyroidism: etiology, pathophysiology, symptoms, Graves' disease, pathophysiology, signs of nonthyroidal Graves' disease, differences of toxic goiter and Basedow's disease; the diagnosis and treatment of hyperthyroidism
- 2 hour

14- Hypothyroidism: Etiology, pathophysiology, symptoms, tests, diagnosis, and treatment of hypothyroidism
, cretinism - 1 hour

15- Carbohydrates Metabolism, mechanisms regulating energy and metabolism, body functions after eating food, starvation metabolism - 1
hour

16- Chemical structure, mechanism of regulation of secretion and peripheral effects of insulin, regulation of blood sugar, anti-insulin hormones – 1 hour

17- Various causes of disturbances in the metabolism of sugar, diabetes mellitus (prevalence, pathogenesis, etiology, classification, pathophysiology, signs, symptoms, and principles of diagnostic tests) - 1 hour

18- Acute diabetic syndromes: etiology, physiopathology, symptoms, principles of diagnostic tests, and treatment of diabetic ketoacidosis and hyperosmolar coma - 1
hour

19- Physiopathology of complications of diabetes: microangiopathy, macroangiopathy, neuropathy, and the skin complications

20- Control of diabetes with diet, oral medications, and insulin - 1 hour
21- Hypoglycemia: causes, classification, symptom, physiopathology, differential diagnosis, principles of diagnostic tests, and treatment
- 1 hour
22- Synthesis, secretion, mechanism, regulation of secretion, physiology of cortical adrenal hormones, principles of diagnostic tests
- 1 hour
23- The etiology, physiopathology, signs, symptoms, diagnosis, and treatment of hyperactive adrenal cortex - 1 hour
24- TThe etiology, physiopathology, signs, symptoms, diagnosis, and treatment of suppressed adrenal cortex - 1 hour
25- Metabolism and the physiological effects of catecholamines, pseudo-transporters, associations with the psychiatric and neurological diseases, associations with blood pressure and antihypertensive drugs; endocrine, symptoms, pathophysiology, diagnosis, and treatment of pheochromocytoma
- 1 hour
26- Pathophysiology of the male reproductive endocrine system: embryology, development of the embryo and abnormalities of developing fetus, physiology of gonadotropic hormones and androgens, and their disorders - 1 hour
27- The etiology, pathophysiology, signs, symptoms, the principles of diagnostic tests for deficiency - 1 hour
28- The endocrinological examination of amenorrhea - 1 hour
29- Hirsutism and virilism - 1 hour
30- Hyperlipidemias - 1 hour
31- Obesity - 1 hour

# Hematologic disorders

Course Title : (32 hours) 4-51

1- Physiology of hematopoietic-lymphatic system: primordial and progenitor cells of blood and lymphatic cells, the structure of bone marrow, the mechanisms of proliferation and differentiation of blood cells in the bone marrow, regulation of hematopoiesis, hematopoietic growth factors - 1 hour

2- Red blood cell indices (MCD-HCHC-MCH-MGV), the morphological classification of anemia, the use of peripheral blood smear, and bone marrow aspiration, bone marrow biopsy - 1 hour

3- Pathophysiology of anemia: the mechanisms causing the symptoms of anemia, the compensatory mechanisms of the body in anemia, the classification of anemia in terms of pathophysiological and clinical signs in general - 1 hour

4- Metabolism of iron and iron deficiency anemia, anemia of chronic diseases, the metabolism of iron, the development of anemia, iron deficiency, clinical signs and symptoms of anemia, hematology, and treatment of iron deficiency
anemia, refractory anemia, erythropoiesis, sideroblastic anemia, hemosiderosis, hemochromatosis - 2 hour

5- Megaloblastic anemias: Metabolism of nucleoproteins, vitamins B12, and folic acid; etiology, classification, the mechanisms of symptoms developing during megaloblastic anemia - clinical and hematological symptoms and their treatment
- 1 hour

6- Bone marrow failure and pancytopenias: complete aplasia, pure aplasia of each one of the cell types, causes, symptoms, clinical hematology, and treatment - 1 hour

7- Secondary anemia: pathophysiology of chronic infections anemia, chronic kidney disease, chronic liver disease, endocrine disorders, collagen diseases, myelogenic cancers anemia, anemia of pregnancy
- 1 hour

8- Pathophysiology hemolysis, hemolytic anemia, and hypersplenism: Overview of hemolysis, intrinsic and extrinsic causes, clinical signs and symptoms, the treatment of hemolytic anemia, hereditary, autoimmune, enzymopathy, hemoglobinuria (paroxysmal nocturnal hemoglobinuria, etc.), hemoglobinopathies (thalassemia, sickle cell, etc.) - 5 hours

9- Pathophysiology of white blood cells, white: physiology of white blood cells, quantitative and qualitative changes in different
conditions - 1 hour

10- Leukemia (acute and chronic): causes, classification, pathophysiology, symptoms, clinical and hematological signs, the treatment of acute and chronic leukemia, erythroleukemia, and other types - 3 hours

11- Bone marrow transplantation: aplastic anemia, malignant hematological diseases, and other types - 1 hour

12- Myeloproliferative disease: pathophysiology, symptoms, clinical and hematology signs, the diagnosis and treatment of polycythemia (primary and secondary), fibrosis, and primary and secondary thrombocythemia - 1 hour

13- Lymphomas: classification, pathophysiology, symptoms, clinical and hematology signs, the treatment of Hodgkin's disease, non-Hodgkin's lymphoma, Burkitt's lymphoma, and mycosis fungoides - 2 hours

14- Plasma cell and immunoglobulins dyscrasia: classification, pathophysiology, symptoms, clinical and hematology signs, the treatment of multiple myeloma, macroglobulinemia, and heavy chain diseases - 1 hour

15- Hemostasis: Physiology of hemostasis - 1 hour

16- Bleeding diseases (vascular and platelet): physiopathology, clinical and laboratory signs, symptoms, the treatment of hereditary and acquired types, vascular purpura, thrombocytopenic purpura - 2 hour

17- Bleeding diseases (disturbances of coagulation): pathophysiology. symptoms, clinical and laboratory signs, the treatment of congenital types such as hemophilia, acquired types such as fibrinolysis, DIC, Anticoagulants - 2 hours

18- Immunohematology: blood groups, blood products and their use cases, transfusion complications, and some general points about hemolytic diseases in newborns - 2 hours

19- The kinetics of tumors and paraneoplastic syndromes: Overview of the kinetics of tumors and the mechanisms causing paraneoplastic syndromes, overview of chemotherapy of tumors, the emergencies related to oncology patients
- 3 hours

# Respiratory diseases

Course Title: (32 hours) 5-51

1- A review of the anatomy of the respiratory system - 1 hour

2- Review the specific semiology of the respiratory system, mechanisms of normal and abnormal breathing
sounds, and the laboratory diagnostic methods - 3 hours

3- Ventilation and perfusion, gas exchange, and breathing control - 3 hours

4- Acid-base balance - 2 hours

5- Physiopathology, symptoms, diagnosis, and the treatment of allergic rhinitis and asthma - 2 hours

6- Physiopathology, symptoms, diagnosis, and the treatment of obstructive pulmonary diseases (tracheitis, simple and chronic bronchitis
, emphysema) - 2 hours

7- Physiopathology, symptoms, diagnosis, and the treatment of interstitial lung diseases (allergies, occupational, granulomatous, vasculitis, etc.
) - 2 hours

8- Physiopathology, symptoms, diagnosis, and the treatment of pulmonary embolism and infarction - 1 hour

9- Lung defense mechanisms and physiopathology, symptoms, diagnosis, and the treatment of non-tuberculous lung infections (viral, bacterial
, fungal, etc.) - 3 hours

10- Physiopathology, symptoms, diagnosis, and the treatment of lung abscess and bronchiectasis - 1 hour

11- Pathophysiology, symptoms, diagnosis, and the treatment of lung tuberculosis - 4 hours

12- Physiopathology of fluid accumulation, pleural amoebiasis, pneumothorax, and neoplasms, pleural disorders
- 2 hours

13- Lung tumors - 2 hours

14- Physiopathology, symptoms, diagnosis, and the treatment ARDS and acute and chronic pulmonary insufficiency - 2 hours

15- Pulmonary manifestations of systemic diseases - 1 hour

16- Miscellaneous diseases (optional) - 1 hour

# Kidney and renal diseases

Course Title: (32 hours) 51-6

1- Anatomy, histology, and physiology of the kidney, renal blood flow, and glomerular filtration , the autonomous regulating factors of glomerular filtration and renal blood flow, the effects of vasoconstrictor substances
on renal blood flow; transport of sodium, potassium, water, hydrogen, and other substances ; renin-angiotensin system; the effects of kidney on the regulation of calcium, phosphorus, and vitamin D - 2 hour

2- Physiopathology, signs, and symptoms of kidney disease:

Hematuria, proteinuria, dysuria, polyuria, oliguria, and edema - 2 hours

3- Laboratory diagnostic methods in kidney diseases - 2 hours

4- Etiology, pathophysiology, symptoms, diagnosis, and the treatment of acute glomerulonephritis and acute renal
failure

5- Etiology, pathophysiology, diagnosis, and the treatment of chronic kidney failure and uremia - 2 hours

6 -Etiology, pathophysiology, diagnosis, and the treatment of kidney and urinary
tract infections; and interstitial nephritis - 2 hours

7- Etiology, pathophysiology, diagnosis, and the treatment of nephrotic syndrome -2 hours

8- Primary hypertension and renal hypertension - 2 hours

9- Kidney and collagen diseases - 2 hours

10- Kidney and systemic diseases - 2 hours

11- Kidney and pregnancy, kidney and drugs - 2 hours

12- Kidneys, water and electrolytes - 2 hours

13- Acid-base disorders -2 hours

14- Congenital kidney disease and kidney tumors - 2 hours

15- Etiology, pathophysiology, diagnosis, and the treatment of kidney stones and obstructive nephropathy - 2 hours

16- Dialysis and kidney transplantation - 2 hours

# Rheumatic diseases

Course Title: (32 hours) 51-7

Overview and introduction of connective tissue - classification of rheumatic diseases - 1 hour

Physiology, structure, and biomechanics of joints - synovial fluid - 1 hour

Immunology and inflammation in the joint diseases - 4 hours

Physiopathology, symptoms, diagnosis, and the treatment of degenerative joint diseases - 2 hours

Physiopathology, symptoms, diagnosis, and the treatment of inflammatory joint diseases and collagenosis, including:

Rheumatic fever, rheumatoid arthritis, systemic lupus erythematosus, scleroderma, polymyositis,
vasculitis, seronegative spondyloarthropathies (ankylosing spondylitis - Reiter syndrome, psoriatic arthritis, inflammatory bowel disease arthritis), periodic rheumatism - 12 hours

Physiopathology, symptoms, diagnosis, and the treatment of joint metabolic diseases ( pseudogout, alkaptonuria, and hemochromatosis) - 2 hours

Physiopathology, symptoms, diagnosis, and the treatment of joint infections, and purulent and tuberculous spondylitis - 2 hours

Physiopathology, symptoms, diagnosis, and the treatment of nonarticular rheumatism (including fibrosi
tis, tendonitis, bursitis, carpal tunnel syndrome) -2 hours

Methods of laboratory diagnosis and analysis of synovial fluid - 1 hour

Technique and indications of intra-articular and extra-articular injections - 1 hour

Principles of pharmacotherapy in rheumatic diseases - 2 hours

Principles of rehabilitation in rheumatic diseases - 2 hours

The third stage

# Clinical Clerkship

Core Syllabus and clinical rotations

The third stage

# Clinical Clerkship:

The minimum length of the Clinical Clerkship stage is **21 months**, which can be divided into two sections Clinical Clerkship1 (or student) and Clinical Clerkship2 (or Extern).

Clinical Clerkship consists of

A. Clinical training
applied Training by **attending hospital clinical departments in clinical rotations**

B. Theoretical courses program
in accompaniment with **theoretical sessions of related Subjects' training.**

Syllabus of Clinical training in rotations will be reviewed further in this document.

Similarities of Clerkship and Internship rotations go back to the role of medical student in practices.
In Clerkship rotations observing the approach to disorders and Patient management is emphasized. In internship rotations active participation as a member of care providing team is pivotal.

Syllabus of theoretical training in clerkship rotations is as follows:

A clinical daily activity plan for medical students in clerkship rotation is as follows:

- 7.5 to 8 AM:
  Patients' visit updates and reviews by students

- 8 To 9 AM
  Morning Report :

  the introduction of the patients admitted to the ward in the night before

  and review of clinical history, physical examinations and first clinical step taken in presence of whole clinical department team including faculty members, Professors, residents, Interns and medical students in clerkship rotations.

- 9 Up to 12 AM:
  educational visits and rounds on patients' bedside, with the participation of professors, assistants , interns and medical students

- 12 to 1 PM:
  Midday off hour

- 1 to 2 pm
  Hospital training conferences (CPC , Conference of mortality and morbidity (Grand round, etc. )

- Followed by:
  Theoretical courses sessions

# Internal Medicine clerkship Rotations

for medical students- Clerkship stage

Course duration: 6 months

Number of credits : 18

Internal Medicine clerkship consists of rotations in:

**Internal medicine general departments,**
**Dermatology,**
**Neurology,**
**and infectious diseases.**

Syllabus of clinical and theoretical training will come further in the Curriculum along with clinical departments rotations.

The curriculum of the clerkship of internal medicine is prepared based on the consensus of the faculty members of universities of medical sciences and vast inquiry from experts of medical education in the universities of medical sciences and deputy of health affiliated to ministry of health and medical education.

Obviously curricular communication with the students, faculty members, educational authorities, and other members of the medical school and university and providing appropriate educational environment is of a considerable importance.

At the end, we bring to your notice that the secretariat of the council for undergraduate medical education welcomes all suggestions and viewpoints of the connoisseurs of universities of medical sciences regarding improvement of the curriculum of undergraduate medical education.

Secretariat of council for undergraduate medical education

***This documented was endorsed in the 3rd Meeting of the Council for Undergraduate Medical Education.***

- **Length of the course:**
  90 days mandatory core program in general internal medicine department
- **Effective teaching hours during the course:** 480 hrs.
- Timing of the lecture-based courses and clinical rotations is generally determined according to the educational program of the clerkship course. All medical students are required to attend in the hospital ward at least since 7:30 AM to 2:00 PM each day and 5 days per week.

**The expected outcome**

**a- knowledge**

The student must have enough knowledge of epidemiology, etiology, pathogenesis, pathology, clinical manifestations, clinical history, influence of potential physical and psychological factors on the patient in the domain of common medical diseases.

**b- Skill**

1- At the end of the course, the student must be able to take clinical history and do accurate and thorough physical examination and prepare the problem list of appropriate differential diagnoses.

2- At the end of the course, the student must find the appropriate approach to the principal complaints and signs of medical diseases.

3- At the end of the course, the student must be able to perform the clinical diagnostic procedures at least on the model.

4- At the end of the course, the student must be able to interpret common laboratory and radiological tests in the domain of internal medicine.

5- At the end of the course, the student must be able to write progress note correctly.

**c- Attitude**

In order to deliver the best medical care, the student must be able to communicate to the patient, his/her family and accompanying person(s), other physicians and health personnel in an appropriate, effective, and empathetic way.

The relationship between the student and the patient must be compassionate and empathetic to build trust. For this purpose:

a- The student must spend time to listen to the patient and accompanying person(s) and through this besides establishing a humane relationship, record and analyze the clinical history and findings for diagnosis and treatment of the disease and inform the patient and accompanying person(s) about the patient's condition, possible risks of different techniques, and necessary preventive measures.

b- The student must consider the influence of factors like age, sex, education, religious- cultural and socioeconomic background on establishing the relationship with the patient and accompanying person(s) and understand the patient's status with this regard.

c- The student must know the importance of research in internal medicine and the process of planning for a research work, executive parts and method of analysis of the results, and, in turn, participate in the research in clinical and basic sciences

. **The criteria and methodology for determining the core content:**

a- prevalence of the disease

b- valid international sources and references

c- to have an impact on the community health

d- to be preventable and included in screening program

e- to be included in the national and regional international programs of the ministry of health

f- to be related to the role of graduates in the health system in the future

**The content to be taught to yield the stated outcomes:**

| number | content |
|---|---|
| 1. | Ability for history taking and physical examination and suggesting a diagnostic plan for the **patient with increased creatinine** |
| 2. | Ability **to interpret acid-base disturbances in ABG** |
| 3. | Ability for history taking and physical examination and suggesting a diagnostic plan for the patient with **common electrolyte imbalances** |
| 4. | Ability for history taking and physical examination and suggesting a diagnostic plan for the patient with **proteinuria and hematuria** |

| | |
|---|---|
| 5. | Ability for history taking and physical examination and suggesting a diagnostic plan for the patient with **hypertension** |
| 6. | Ability for history taking and physical examination and suggesting a diagnostic plan for the patient with **dysuria** |
| 7. | Ability for history taking and physical examination and suggesting a diagnostic plan for the patient with **anemia** and approach to it |
| 8. | Ability for history taking and physical examination and suggesting a diagnostic plan for the patient with **thrombocytopenia** |
| 9. | Ability for history taking and physical examination and suggesting a diagnostic plan for the patient with the **bleeding signs** and symptoms related to the **coagulation system** |
| 10. | Ability for history taking and physical examination and suggesting a diagnostic plan for the patient with **increased and decreased leukocyte** |
| 11. | Ability for history taking and physical examination and suggesting a diagnostic plan for **the patient with lymphadenopathy** |
| 12. | Ability to take history and perform physical examination and to consider a diagnostic plan for the **patient with splenomegaly** and hepatomegaly and approach to them |

| | |
|---|---|
| 13. | Ability for history taking and physical examination and suggesting a diagnostic plan for the **patient with fever and FUO** (fever of unknown origin) |
| 14. | Ability for history taking and physical examination and suggesting a diagnostic plan for the **patient with thyroid enlargement** |

| | |
|---|---|
| 15. | Ability for history taking and physical examination and suggesting a diagnostic plan for the **patient with musculoskeletal pain** |
| 16. | Ability for history taking and physical examination and suggesting a diagnostic plan for the **patient with diabetes mellitus** |
| 17. | Ability for history taking and physical examination and suggesting a diagnostic plan for the patient with **low back pain** |
| 18. | Ability for history taking and physical examination and suggesting a diagnostic plan for the **patient with arthralgia** |
| 19. | Ability for history taking and physical examination and suggesting a diagnostic plan for the **patient with dyspnea** |
| 20. | Ability for history taking and physical examination and suggesting a diagnostic plan for the **patient with hemoptysis** |
| 21. | Ability for history taking and physical examination and suggesting a diagnostic plan for **the patient with pleuritis and pleural effusion** |
| 22. | Ability for history taking and physical examination and suggesting a diagnostic plan for the **patient with acute and chronic cough** |
| 23. | Ability for history taking and physical examination and suggesting a diagnostic plan for the **patient with deep vein thrombosis** |
| 24. | Ability for history taking and physical examination and suggesting a diagnostic plan for the **patient with GI bleeding** |

| | |
|---|---|
| 25. | Ability for history taking and physical examination and suggesting a diagnostic plan for the **patient with abdominal pain** |
| 26. | Ability for history taking and physical examination and suggesting a diagnostic plan for the **patient with dyspepsia** |
| 27. | Ability for history taking and physical examination and suggesting a diagnostic |
| | plan for the **patient with constipation** |
| 28. | Ability for history taking and physical examination and suggesting a diagnostic plan for the **patient with diarrhea** |
| 29. | Ability for history taking and physical examination and suggesting a diagnostic plan for the **patient with vomiting** |
| 30. | Ability for history taking and physical examination and suggesting a diagnostic plan for the **patient with icterus or abnormal liver function tests** |
| 31. | Ability for history taking and physical examination and suggesting a diagnostic plan for the **patient with ascites** |

## Skills and abilities

**that a student must obtain in the internal medical ward:**

| | |
|---|---|
| 1 | **Thorough history taking and accurate physical examination** |
| 2 | Methodologic of **writing the clinical course** and **daily recording** |
| 3 | **ABG taking** ( at least on the model) |
| 4 | Insertion of **endotracheal tube**( at least on the model) |
| 5 | **Cardiovascular resuscitation**( on the model) |
| 6 | **Differentiation of normal EKG from abnormal one** |
| 7 | Insertion **of nasogastric tube** and **gastric lavage** |
| 8 | Ability to **prepare and exam urine sample under microscope** |
| 9 | Ability for **analysis of urine by means of urinary test tapes** |

| | |
|---|---|
| 10 | Ability for **performing and analyzing CBC** (Cell blood Count) |
| 11 | Ability to **exam the stool for OB&OP** |
| 12 | Ability to **gram stain of sputum, urine, and ascitic, pleural, synovial , and cerebrospinal fluid** |
| 13 | Ability to do **lumbar puncture** (at least on the model) |
| 14 | Ability to do **knee joint synovial fluid puncture** (at least on the model ) |
| 15 | Ability to do **pleural fluid puncture** (at least on the model) |
| 16 | Ability to do **ascitic fluid puncture** (at least on the model) |
| 17 | Ability to do **ophthalmoscopy** |
| 18 | Ability to **interpret ECG** |
| 19 | Ability to **interpret CXR** (Chest x-Ray) |

| | |
|---|---|
| 20 | Ability to interpret **simple Abdominal Radiography** |

**Teaching and learning method:**

Medical schools are required to apply the most appropriate educational strategies and teaching and learning methods for each of the above-mentioned contents according to the subject and within the limits of available educational facilities. Some of these methods are noted below:

Role playing, role model, video presentation, small group discussion, bedside- teaching, procedural skill teaching, task- based teaching, case- based teaching, etc.

**Formative assessment of knowledge, skill, and attitude and feedback technique during the course (Timing and frequency of assessments must be stated.)**

- Formative and summative assessments must be done during and at the end of the course, respectively.

Assessment is required to target the knowledge, skill, and attitude. Assessment tools must be valid and reliable

For instance, some assessment tools are mentioned below:

1-Logbook, 2- DOPS, 3- Mini CEX, 4- OSCE,

5-CBD ( case based discussion),

6- descriptive written examination and MCQ,

7- oral examination, 8- global rating form

**11- Curricular communication**

- The curriculum must be available to the learners, faculty members, and educational and executive authorities of medical school or university at the beginning of the course and reachable at the university website.

**12- Curricular management**

- For implementation of the program, the necessary preparations including faculty member education must be considered.

- Continuous monitoring of the program by deputy of undergraduate medical education is necessary.

- Department chair must report the result of the program evaluation to the medical school in regular intervals

- Dean of the medical school is required to resolve the problems regarding implementation of the program with joint work of the authorities of the faculty.

**12- Principal examination resources**:

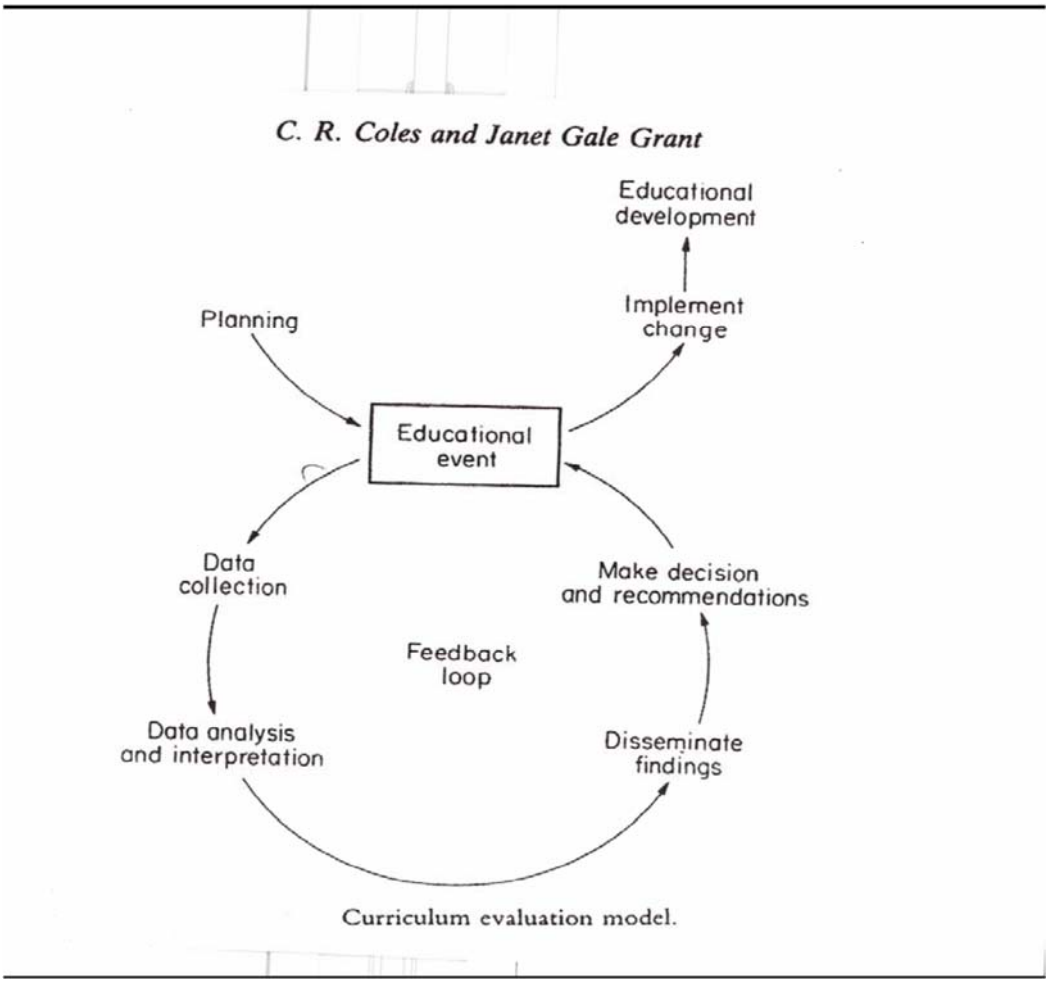
**Principal examination resources are the same as the comprehensive (pre-internship) examination, including**:

1- Kasper DL, et al. **Cecil Essentials of Medicine**/Latest edition. W.B. Saunders

2- Braunwald Eugene, et al. **Harrison's Principles of Internal Medicine**. Latest edition. Mc Grawhill;

**13- Curriculum evaluation**

- For each course, the curricular program must be evaluated by the educational department and under supervision of the medical school, according to the following model. The results must be considered for quality improvement of the educational program in the future courses:




Curriculum evaluation model.

Educational department is required to submit the written report of the program evaluation to the medical school in regular intervals and also a copy of the report and actions taken to the members of the evaluation unit of secretariat of the council for undergraduate medical education in order to improve and ameliorate the program.

# Trainees' competencies and qualifications at the end of Internal medicine clerkship course

Hereby expected competencies at the end of internal medicine clinical rotation clerkship course is mentioned in detail.

subsequently **more improved competencies in skills and more independence** is expected in Internship clinical rotations

Competencies include:

1. Clinical skills
2. Communication skills
3. Patient's care (prognosis, treatment, rehabilitation)
4. Health promotion and disease prevention
5. Personal development
6. Professionalism and medical ethics
7. Decision making skills, reasoning and problem solving skills
8. Health system and practitioner's role

## Definitions

**1.Clinical skills**

At the end term of the internal medicine clerkship course trainee must be competent and qualified in a wide range of clinical skills including taking patient's case history and his or accomplishing her clinical examination, recording and presenting medical information , performing procedures and laboratory tests based on the defined standards.

**2.Communication skills**

At the end term of the internal medicine clerkship course trainee must be competent and qualified in effective communication process with patient and his or her coworker. Moreover, he or she must demonstrate his or her competency and qualification in oral and written communication process.

**3.Patient's care (Diagnosis, treatment and rehabilitation)**

The trainee must have a general view toward patient at the end of internal medicine clerkship , he or she must competently provide a list where patient's issues and differential diagnoses are recorded, he or she must chose a proper diagnosis method, and must define a healthcare program to achieve the specified objectives in dealing with patient's issues. He or she must know specific conditions when a patient needs consultation and he or she must be presented to other specialty or subspecialty practitioners.

**3.Health promotion and disease prevention**

At the end of internal medicine clerkship course, the trainee must be linked to coworkers and directors involved in health delivery services to promote personal and communal health, he or she must be competent enough to asses and evaluate health conditions, to identify risk factors, and prognosis determinants. As a team member, he or she must be qualified to decide on promoting primordial and secondary prevention methods as expected for interventions.

**4.Personal development**

At the end of internal medicine clerkship course, the trainee must realize the importance of personal development , including self-care promotion , he or she must appreciate mental, psychological, socioeconomic occupational qualifications, also non-medical sciences that affect on personal and professional life, such as self-knowledge, change psychology, leadership and management principles and informatics , also he or she must know how they are enforced.

**5.Professionalism and medical ethics**

At the end of internal medicine clerkship course, the trainee must believe that Allah, the almighty is the only healer , patients must just rely on Allah for their cure . also, all of us know that we practitioners only facilitate healthcare to successfully help and assist patients , all of us appreciate and respect and we are adhered to professionalism and

medical ethics. We practitioners adhere to oath and guidelines of medical ethics which are rooted in Islamic teaching, we understand that piety is the base of adherence to professionalism and medical ethics. Also we practitioners must competently identify ethical issues of medicine and we should be qualified to adhere legal and moral requirements , we should respect cultures and beliefs of the interested people and we must analyze these issues to take proper decision.

**6.Decision making , reasoning and problem solving skills**

At the end of internal medicine clerkship course, the trainee must capably deal with issues, identify their dimensions, he and she must be competent and qualified in collecting information related to the best available resources for assessment and evaluation, he or she must identify different solutions for evaluation and assessment, he or she must capably estimate possible consequences, to realize how to decide during uncertainty . he or she must capably merge the capacity and qualification with priorities, accepted values by health service providers and related community as well as cost effectiveness.

**7.Health system and practitioner's role**

At the end of internal medicine clerkship course, the trainee must identify and realize his or her role in health system as a doctor, teacher, investigator, and director and leader, he or she must know how health services and leadership should be realized.

# 1. Clinical skills

At the end term of the internal medicine clerkship course trainee must be competent and qualified in a wide range of clinical skills including taking patient's case history and his or accomplishing her clinical examination, recording and presenting medical information , performing procedures and laboratory tests based on the defined standards.

| Subset | Competencies at the end term of internal medicine clerkship | Expected competencies at the end of internal medicine clerkship course | Supervisor |
|---|---|---|---|
| **Getting patient's medical history, case history, and patient's history from his/her accompanies** | Taking comprehensive e medical history | Independent | Internal medicine department |
| | Taking comprehensive e medical history in geriatric /elderly patient | Independent | Internal medicine department |

| | | | |
|---|---|---|---|
| | Taking **chief-complaint-based** medical history in a specific situation | Independent | Internal medicine department |
| **Competent at clinical examination** | Elderlies' general and comprehensive examinations , respecting patient's privacy and canonical limits | Independent | Internal medicine department |
| | Examination of patient's mental status | Independent | Internal medicine department |
| | Clinical examination by focusing on Chief complaint and allocating priorities in emergency and non-emergency cases | Emergency: Perform under Supervision in clerkship rotations- Independent in Internship<br>Non-emergency: Independent | Internal medicine department |

| | | | |
|---|---|---|---|
| • Information documentation and dissemination Trainee must be capable to correctly record information and data related to inpatient and outpatient, his or her oral or written information must be transferred and disseminated properly at the end of internal medicine clerkship, including: | Documentation in patient's profile (Including initial findings) | Independent | Internal medicine department |
| | Clinical progress Note | Independent | Internal medicine department |
| | Write down medical orders and clinical summary | Perform under Supervision in clerkship rotations- Independent in Internship | Internal medicine department |
| | Writing down Counseling Notes | Perform under Supervision in clerkship rotations- Independent in Internship | Internal medicine department |
| | Writing down discharge and referral documents | Perform under Supervision in clerkship rotations- Independent in Internship | Internal medicine department |

| | | | | |
|---|---|---|---|---|
| | | explaining in patients narrative about procedures & Procedures documentations | Perform under Supervision in clerkship rotations- Independent in Internship<br>(mandatory for the procedures that the medical trainee is competent enough to do) | Internal medicine department |
| | | Writing down death certificate | Perform under Supervision in clerkship rotations- Independent in Internship | Internal medicine department |
| Competent enough to practically perform following procedures: | | | | |
| Internal medicine trainee must be competent and qualified enough to enforce ordinary clinical procedures, he or she must notify | | Intravenous blood sampling<br><br>Peripheral efficient Intravenous access | Independent | Internal medicine department |

| | | | |
|---|---|---|---|
| the related patient on the side effects and limitations, while he or she is directly Performing under Supervision of superiors in clerkship rotations- Independent in Internship in the administration process of the procedures.<br><br>Core procedures of internal medicine are: | Blood sampling for culture | Independent | Internal medicine department |
| | Glucometer application , and giving instructions to patient on how to use it | Perform under Supervision in clerkship rotations- Independent in Internship | Internal medicine department |
| | Arterial blood samples to measure arterial blood gas ABG<br><br>From extremities and femoral | Perform under Supervision in clerkship rotations- Independent in Internship | Internal medicine department |
| | Insulin injection and giving instructions to patient on how to use | Independent | Internal medicine department |
| | Injections:<br><br>intravenous /subcutaneous /intramuscular /intradermal | Independent | Internal medicine department |

| | | | |
|---|---|---|---|
| | Cardiac defibrillation | Active observer | Department of cardiology and anesthesiology |
| | Narcosynthesis | Perform under Supervision in clerkship rotations- Independent in Internship | Department of cardiology and anesthesiology |
| | abdominal paracentesis | Perform under Supervision in clerkship rotations- Independent in Internship | Internal medicine department |
| | Knee joint fluid aspiration | Perform under Supervision in clerkship rotations- Independent in Internship | Internal medicine department |
| | Inhaler usage and giving instructions to patient on how to use the inhaler | Independent | Internal medicine department |

| | | | |
|---|---|---|---|
| | Using hemodynamic monitoring devices | Active observer | Department of internal medicine and cardiology |
| | Inserting the gastric tube through the nose | Active observer | Internal medicine department |
| | Graduated university student must be competent in utilization of the following procedures: | | |
| | Primary usage of the ventilator | Active observer | Department of Internal medicine and anesthesiology |
| | External cardiac peacemaker insertion | Active observer | Department of internal medicine and cardiology |

| | | | |
|---|---|---|---|
| Basic laboratory tests and diagnosis<br>At the final term of internal medicine clerkship, the trainee must be competent and qualified for laboratory test and ordinary diagnosis while he or she is Perform under Supervision of superiors in clerkship rotations- Independent in Internship, he or she must know the limitations, and primary interpretations : | Sampling for proper test method ( Blood, urine, pharynx, sputum) | Independent | Infectious disease department and Internal medicine department |
| | Tuberculin test | Independent | Infectious disease department and Internal medicine department |
| | Electrocardiography | Independent | Department of internal medicine and cardiology |
| | peripheral blood smear | Independent | Department of internal medicine |
| | Blood flow and coagulation test | Active observer | Department of internal medicine |

# Communication skills

At the end term of the internal medicine clerkship course trainee must be competent and qualified in effective communication process with patient and his or her coworker. Moreover, he or she must demonstrate his or her competency and qualification in oral and written communication process.

| subset | Competencies | Expected level after final term of internal medicine clerkship course | Supervisor |
|---|---|---|---|
| Basic interpersonal communication skills | Effective interpersonal communication skills (Including active listening, sympathy, effective expression, non-verbal , verbal, visual communication and so forth) | Independent | Related clinical department with cooperation of Internal medicine department and psychiatry department |
| Effective communication with patient, his/her accompany and his/her family members | Effective communication with patient, accompany and his or her family members<br>( by emphasizing on systematic information collection and competency in responsiveness to the common questions and primary teaching | Independent | Related clinical department with cooperation of Internal medicine department |

| | | | |
|---|---|---|---|
| Effective communication with patient, his/her accompany and his/her family members | **Communication with coworkers, medical staff, and state organization Specially in verbal and written form** | Perform under Supervision in clerkship rotations- Independent in Internship | Related clinical department with cooperation of Internal medicine department |
| | Competent and qualified enough to write down effective scientific texts buy utilization of educational assistance systems | Independent | Related clinical department with cooperation of Internal medicine department |

# 3. Health promotion and disease prevention

At the end of internal medicine clerkship course, the trainee must be linked to coworkers and directors involved in health delivery services to promote personal and communal health, he or she must be competent enough to asses and evaluate health conditions, to identify risk factors, and prognosis determinants. As a team member, he or she must be qualified to decide on promoting primordial and secondary prevention methods as expected for interventions.
Meanwhile, the internal medicine trainee is expected to be capable and qualified enough to perform visit, to examine, to prescribe medicine and nutrition, to consult and to involve in the delivery of health services during acute and chronic emergency situations whenever a patient is affiliated with **common diseases**.

| Subset | Competencies | Expected competency level | Authority |
|---|---|---|---|
| General principles of patient's healthcare | 1. Trainee must competently differentiate emergency case against non-emergency and actively cooperate with the related teamwork for patient's proper healthcare.<br>2. As a team member of the healthcare must appropriately care his or her patient.<br>3. He or she must qualifiedly take patient's examination and case -history, enlist the differentiated issues, to relate them to a pathogen and an etiology.<br>4. He or she must be competent enough to perform clinical tasks based on approved or rejected differential diagnoses, laboratory tests, and imaging systems.<br>5. He or she must be qualified enough and capably interpret laboratory test results, imaging methods, and clinical diagnoses related to common clinical presentations, and common diseases.<br>6. He or she must competently and correctly interpret patient's obtained information through the most possible diagnosis. | Independent | Internal medicine department |

| Subset | Competencies | Expected competency level | Authority |
|---|---|---|---|
| | 7. He or she must offer a proper healthcare schedule for drugs, operation, nutrition and psychological issues based on patient's diagnosed disease or based on the defined scopes.<br>8. He or she must competently define patient's care schedule by focusing on the following factors:<br>• Must pay attention to patient's all physical, mental and intellectual issues<br>• Must pay attention to emergent cases that patient is faced and his or her threatening risk factor<br>• Must pay attention to proportion of available costs based on his or her work conditions<br>• Must focus on side effects of the treatment methods<br>• He or she must respect patient's religious beliefs, ideas, concerns, tendencies, and expectations.<br>• He or she must adhere to professionalism and medical ethics<br>1. Trainee must capably differentiate inpatient requirement against outpatient ones.<br>2. Must know limitations of the treatment, and causes of patient's presentation and consultation.<br>3. Trainee must focus on patient's disease progress and must be qualified to define a schedule for patient's care. | | |

| Subset | Competencies | Expected competency level | Authority |
|---|---|---|---|
| Drug prescription | Trainee must competently observe prescription principles whenever the visited patient needs to consume drug by focusing on following factors for drug of choice or proper dose:<br>• Patient's age and gender<br>• General conditions and related diseases<br>• Pharmaceutics and mechanism of drug effect<br>• The most appropriate method for drug consumption , side effects, clinical and paraclinic interferences due to drug consumption<br>• Cost of drug and its accessibility based on patient's lifestyle and living conditions | Independent | Internal medicine department |
| Nutrition | 1. Trainee must competently offer necessary recommendations for patient's nutrition.<br>2. He or she must know how nutrition and disease are related to perform corrective actions.<br>3. He must be qualified enough to distinguish and diagnose malnutrition and increased risk of disease or decreased response to treatment.<br>4. Trainee must be competent enough to distinguish and diagnose specific trophic prescriptions. | Independent | Internal medicine department cooperating with nutrition ward |

| Subset | Competencies | Expected competency level | Authority |
|---|---|---|---|
| | 5. Trainee must be qualified enough to realize and diagnose<br>6. Trainee must be competent enough to detect conventional drugs interactions with nutrional habits of the patients and common diseases. | | |
| Supportive actions | He or she must especially take measures to reduce patient's protests on pain through diagnosis, therapy and relief | Independent | Internal medicine department cooperating with the traditional medicine department |
| Patient's rehabilitation | Trainee must necessarily notify the patient about primary rehabilitation and common diseases | Perform under Supervision in clerkship rotations- Independent in Internship | Internal medicine |
| Complementary medicine and traditional medicine | Trainee must necessarily learn national complementary and traditional medicine | Active observer | Internal medicine department cooperating with the traditional medicine department |

# 4. Health promotion and disease prevention

At the end of internal medicine clerkship course, the trainee must be linked to coworkers and directors involved in health delivery services to promote personal and communal health, he or she must be competent enough to asses and evaluate health conditions, to identify risk factors, and prognosis determinants. As a team member, he or she must be qualified to decide on promoting primordial and secondary prevention methods as expected for interventions.

| **Subset** | **Competencies** | Expected competency level at the end term of internal medicine clerkship course | **Authority** |
|---|---|---|---|
| **Assessment of health status** | He or she must be competent to define patient's current and ideal status and the visited individual or community | Independent | Related specialty department , in cooperation with internal medicine department |
| **Implementation and realization of risk factors of health** | 1. He or she must identify and realize risk factors of visited individual or community (such as smoking, risky behaviors, environmental, economic and social factors)<br>2. He or she must identify and realize health interventions to reduce risk impacts on the visited subject or community which includes primary disease preventions, ( preventing first level risk factors.) | Independent | Related specialty department , in cooperation with internal medicine department |
| **Implementation and realization of guidelines of health promotion based on early diagnosis and timely treatment** | 1. To properly identify and realize the second level health interventions (Screening)<br>2. To properly identify and realize secondary health preventions in relatives of the afflicted people.<br>3. To properly identify and realize health interventions | Independent | Related specialty department , in cooperation with internal medicine department |

| Subset | Competencies | Expected competency level at the end term of internal medicine clerkship course | Authority |
|---|---|---|---|
| | for controlling common diseases including:<br>• Infectious diseases<br>• Accidents<br>• Cardiovascular diseases<br>• Cancers<br>• Issues of mental health | | |

# 5. Personal development

At the end of internal medicine clerkship course, the trainee must realize the importance of personal development , including self-care promotion , he or she must appreciate mental, psychological, socioeconomic occupational qualifications, also non-medical sciences that affect on personal and professional life, such as self-knowledge, change psychology, leadership and management principles and informatics , also he or she must know how they are enforced.

| Subset | Competencies | Expected competency level at the end term of internal medicine clerkship | Authority |
|---|---|---|---|
| **physical** | Principles of healthy lifestyle , including physical exercises, proper nutrition, and avoidance of risky behaviors | Independent | Related specialty department , in cooperation with internal medicine department |
| **Psychological skills for personal promotion** | 1. He or she must utilize psychological skills for personal promotion, (specifically he or she must promote self-awareness skills, decisiveness, self-assurance, rage management, excitement and stress, time management, lead life, targeting and planning)<br>2. He or she must utilize intellectual and religious teachings to promote , peace , mental potency, positive attitude, motivation and hope<br>3. He or she must be capable to realize his or her educational needs and improve his or her competencies and qualifications by utilizing proper methods.(Lifelong learning). | Independent | Related specialty department , in cooperation with internal medicine department |
| **Social, economic and occupational competencies in choosing a career** | 1. He or she must be capable to knowingly choose a short-term and long-term career path. | Independent | Related specialty department , in cooperation with |

| | | | |
|---|---|---|---|
| **path to improve his or her economic status** | 2. He or she must be competent and qualified to respect medical ethics , and must implement principles of economic management to improve her or his economic status. | | internal medicine department |
| **Information technology** | 1. He must competently use information technology skis including Windows, e-mail, web-search, typing principles, Word, Excel, PowerPoint and SPSS software for statistical analysis.<br>2. He or she must be competent in utilization of electronic medical documentations (books and magazines).<br>3. He must capably use patients' profile documentations, record the file via electronic system for his/her utilization. | Independent | Related specialty department , in cooperation with internal medicine department |
| **Others** | 1. He or she must be capable to utilize English language at an acceptable level<br>2. He or she must know how to save and record his or her medical documentations (on log book and portfolio.) | Independent | Related specialty department , in cooperation with internal medicine department |

# 6. Professionalism and medical ethics

At the end of internal medicine clerkship course, the trainee must believe that Allah, the almighty is the only healer , patients must just rely on Allah for their cure . also, all of us know that we practitioners only facilitate healthcare to successfully help and assist patients , all of us appreciate and respect and we are adhered to professionalism and medical ethics. We practitioners adhere to oath and guidelines of medical ethics which are rooted in Islamic teaching, we understand that piety is the base of adherence to professionalism and medical ethics. Also we practitioners must competently identify ethical issues of medicine and we should be qualified to adhere medical code of ethics and medical law, we should respect cultures and beliefs of the interested people and we must analyze these issues to take proper decision.

| subset | Competencies | Expected competency level after end term of internal medicine clerkship course | Supervisor |
|---|---|---|---|
| Competent at professionalism, philanthropy, respect, deontology, career excellence, justice, honesty and righteousness | | Independent | Related clinical department and cooperation with internal medicine department |
| **Medical law and regulations** | 1. Must be familiar with medical law stand professionalism and criteria (know how to issue death certificate, patients' obligatory report, prescription, obligatory hospitalization and so forth) and must necessarily respect them.<br>2. He or she must adhere to the regulations and professional duties relegated by health | Perform under Supervision in clerkship rotations- Independent in Internship | Related clinical department and cooperation with internal medicine department |

| | | | |
|---|---|---|---|
| | system service delivery or related ward.<br><br>3. Must be accountable to supervising authorities of the health system. | | |
| **Reasoning and moral decision making** | 1. He or she must know basic ethical concepts in medicine to utilize them in moral reasoning. | Independent | Related clinical department and cooperation with internal medicine department |

# 7. Decision making, reasoning and problem-solving skills

At the end of internal medicine clerkship course, the trainee must capably deal with issues, identify their dimensions, he and she must be competent and qualified in collecting information related to the best available resources for assessment and evaluation, he or she must identify different solutions for evaluation and assessment, he or she must capably estimate possible consequences, to realize how to decide during uncertainty . he or she must capably merge the capacity and qualification with priorities, accepted values by health service providers and related community as well as cost effectiveness.

| Subset | competencies | Expected competency level at the end of internal medicine clerkship course | Supervisor |
|---|---|---|---|
| **Critical thinking** | 1. Must be capable to assess presentations and related thinking elements based on thinking standards with respecting intellectual traits.<br>2. Must consider reasoning errors (sophistry) and cognition errors with logical reasoning. | Perform under Supervision in clerkship rotations- Independent in Internship | Cooperation of related specialty department with internal medicine department |
| **Problem solving**[1] | • Must competently identify and analyze problems and propose solutions. | Perform under Supervision in clerkship rotations- Independent in Internship | Cooperation of related specialty department with internal medicine department |
| **Evidence based medicine** | 1. Must competently identify available electronic and non-electronic resources to extract authentic evidences through investigation.<br>2. Must capably utilize secondary evidences, reference books, algorithms, and guidelines.<br>3. Must consider evidence based medical limitations in daily accomplishments. | Perform under Supervision in clerkship rotations- Independent in Internship | Cooperation of related specialty department with internal medicine department |

[1] Problem solving

# 8. Health system and practitioner's role

At the end of internal medicine clerkship course, the trainee must identify and realize his or her role in health system as a doctor, teacher, investigator, and director and leader, he or she must know how health services and leadership should be realized.

| Subset | Competencies | Expected level at the end of internal medicine clerkship course | Supervisor |
|---|---|---|---|
| **PHC/ secondary and tertiary healthcare service delivery** | 1. To recognize Iranian health system and the components<br>2. To become familiar with best practices and health systems internationally<br>3. To know how to implement practically Guidelines and manuals of Iranian health system | Perform under Supervision in clerkship rotations-<br>Independent in Internship | Cooperation of related specialty department with internal medicine department |
| **Instructor/ mentor/ Teacher** | 1. To teach well healthy lifestyle to client and his or her family | Perform under Supervision in clerkship rotations-<br>Independent in Internship | Cooperation of related specialty department with internal medicine department |
| **Investigator** | 1. As a member of health team cooperate in health investigations and health service delivery | Perform under Supervision in clerkship rotations-<br>Independent in Internship | Cooperation of related specialty department with internal medicine department |

| | | | |
|---|---|---|---|
| **Director of health service delivery** | 1. To analyze how health services are delivered and distributed, also to analyze unit resources. | Perform under Supervision in clerkship rotations-<br>Independent in Internship | Cooperation of related specialty department with internal medicine department |
| **Health leader** | 1. To identify methods of health promotion and support (Such as cooperation with people and intersectoral cooperation).<br>2. To identify required methods for health promotion of key stakeholders. | Perform under Supervision in clerkship rotations-<br>Independent in Internship | Cooperation of related specialty department with internal medicine department |

Internal medicine department

**Knowledge domain**
Mandatory clinical presentations

— Education and learning of core contents that follows should cover coherent approach to the Symptoms, signs, or Diseases, including **Pathophysiology, algorithmic diagnostic approach, clinical assessment and approach algorithms, management and Therapies.**

— The following minimal competencies are to be achieved during clerkship rotation. Mandatory syllabus for Internship stage is mentioned in other chapters of the curriculum.

| Common clinical presentations | Authority<br>Education Body |
|---|---|
| ▪ Anorexia<br>▪ Weakness/Fatigue<br>▪ Checkup order (Screening protocols)<br>▪ Health suggestions for different age groups<br>▪ Including diet, exercise, mental health, risky behaviors ,and specific habits such as smoking, alcohol consume, etc. | **Internal medicine-General** |

| | |
|---|---|
| ▪ Improvement of lifestyle (weight , blood pressure, blood sugar, and blood cholesterol) | |
| ▪ Indigestion<br>▪ Vomit<br>▪ Jaundice<br>▪ Abdominal distention<br>▪ Abdominal pain<br>▪ Constipation<br>▪ Dysphagia<br>▪ Gastrointestinal Bleeding | **Internal medicine**<br>**Gastroenterology** |
| ▪ Anemia<br>▪ Abnormal bleeding (hemostasis disorders)<br>▪ Enlarged lymph nodes and spleen<br>▪ (Lymadenopaties and Splenomegaly) | **Internal medicine**<br>**hematology** |
| ▪ Backache<br>▪ Neck pain<br>▪ Arthritis/ Joint pain<br>▪ Muscle pain/Weakness | **Internal medicine**<br>**Rheumatology** |
| ▪ High Blood Cholesterol<br>▪ Abnormal Blood Sugar<br>▪ Disruption of thyroid function test | **Internal medicine**<br>**Oncology** |

| | |
|---|---|
| ▪ Cough/Phlegm/ Hemoptysis<br>▪ Cyanosis<br>▪ Shortness of breath/Wheezing/Respiratory Distress | **Internal Medicine**<br>**pulmonary** |
| ▪ Edema<br>▪ Pain with Urination/Frequent Urination<br>▪ Polyuria/ Nocturia<br>▪ Hematuria<br>▪ dehydration / hypovolemia<br>▪ high blood pressure | **Internal Medicine**<br>**Nephrology** |
| ▪ Hypertension<br>▪ Chest pain<br>▪ Heart palpitation<br>▪ Syncope/Faint | **Internal medicine**<br>**Cardiology** |

Internal medicine department

— **Knowledge domain**
common diseases at internal medicine department

**Essential and mandatory Syllabus**

Education and learning of core contents that follows should cover coherent approach to the Symptoms, signs, or Diseases, including **Pathophysiology, algorithmic diagnostic approach, clinical assessment and approach algorithms, management and Therapies.**

| Outpatient Core Syllabus<br>**Common disease at clinic** | Inpatient Core Syllabus<br>**Common diseases at ward** | **Authority** |
|---|---|---|
| ▪ Colds, respiratory infections,<br>▪ screening tests,<br>▪ referral system,<br>▪ anemia, megaloblastic anemia<br>▪ impaired liver function,<br>▪ weight loss,<br>▪ fever,<br>▪ abdominal pain, dyspepsia,<br>▪ diabetes,<br>▪ asthma, cough,<br>▪ backache,<br>▪ syncope,<br>▪ impaired thyroid function | ▪ DVT,<br>▪ CHF,<br>▪ COPD,<br>▪ GIB،<br>▪ FUO<br>▪ ،PTE<br>▪ ،UTI<br>▪ Pneumonia, asthma, dyspnea,<br>▪ edema and ascites,<br>▪ pancytopenia,<br>▪ acute and chronic renal failure,<br>▪ electrolyte imbalances,<br>▪ sepsis,<br>▪ anemia,<br>▪ oral intolerance,<br>▪ mass in the chest, | **Internal medicine - General ward and outpatient clinics** |

| | | |
|---|---|---|
| | ▪ jaundice, chronic diarrhea | |
| ▪ IBS،<br>▪ PUD،<br>▪ IBD<br>▪ Reflux,<br>▪ gastrointestinal cancer,<br>▪ hepatitis,<br>▪ dysphagia, dyspepsia,<br>▪ gallstones | ▪ Gallstones,<br>▪ cirrhosis &its complications,<br>▪ gastrointestinal bleeding,<br>▪ gastrointestinal cancer,<br>▪ peptic ulcer,<br>▪ pancreatitis<br>▪ IBD | **Internal medicine Gastroenterology** |
| ▪ Back pain,<br>▪ neck pain, pelvic pain,<br>▪ osteoarthritis,<br>▪ periarthritis,<br>▪ monoarthritic and polyarthritis,<br>▪ osteoporosis,<br>▪ bone pain,<br>▪ gout arthritis,<br>▪ Discopathy | o Vasculitis,<br>o SLE,<br>o myositis,<br>o scleroderma,<br>o rheumatoid arthritis | **Internal medicine Rheumatology** |
| ▪ Hypothyroidism,<br>▪ hyperthyroidism,<br>▪ diabetes mellitus, typed i and ii<br>▪ insulin therapy management, follow-up, and evaluations<br>▪ obesity | ▪ Hirsutism,<br>▪ Gonadal disorder,<br>▪ hypothyroidism,<br>▪ hyperthyroidism,<br>▪ diabetes mellitus, typed i and ii<br>▪ DKA diagnosis and management<br>▪ hypertension | **Internal medicine Endocrinology** |
| ▪ Pneumonia,<br>▪ asthma,<br>▪ COPD,<br>▪ PTE, | ▪ Pneumonia,<br>▪ asthma,<br>▪ COPD,<br>▪ PTE, | **Internal medicine Pulmonary** |

| | | |
|---|---|---|
| ▪ lung cancer,<br>▪ tuberculosis<br>▪ Cough,<br>▪ allergy | ▪ lung cancer,<br>▪ tuberculosis<br>▪ Hemoptysis,<br>▪ respiratory failure<br>▪ PAH | |
| ▪ Nephrolithiasis,<br>▪ flank pain | ▪ Electrolyte disturbances<br>▪ Dialysis indications | **Internal medicine Nephrology** |
| ▪ Chest pain,<br>▪ Palpitations and arrythmia,<br>▪ Syncope | ▪ Valvular abnormalities ,<br>▪ AF,<br>▪ ACS | **Internal medicine Cardiology** |
| ▪ Thalassemia,<br>▪ Iron deficiency anemia<br>▪ Anemia approach | ▪ Thalassemia major<br>▪ Anemia approach<br>▪ Hereditary and acquired aplastic anemia | **Internal medicine hematology** |

Note: Common clinical presentation authority is just designated for formal teaching of the department, also, teaching may take place in other Clinical wards too.

# Surgery clerkship Rotation

for medical students- Clerkship stage

Course duration: 4 months

Number of credits : 12 (10+2 credits)

Surgery clerkship consists of rotations in:

**General surgery department,**

**urology department,**

and **orthopedics department.**

Syllabus of **clinical training** will come further in the Curriculum along with clinical departments rotations.

Syllabus of **theoretical training** in surgical diseases for medical students in clerkship rotation is as follows:

Number of credits: 10

Course type: theoretical

Prerequisite : None

Course Title :

# Theoretical Surgical disorders- for medical students in clerkship rotation

170 hours

1 -fluids and electrolytes in operated patients
composition of natural fluids and electrolytes
Fluid and electrolytes needed for pre and post op patients
factors Which caused changes in the needs. 2 hours

2 - abnormal fluid body shifts, fluid loss and increase the volume of fluids and electrolytes the body

1 hour

3 -The balance of acid and base
acidosis and alkalosis (metabolic and respiratory)

1 hour

4 -The importance of nutrition in patients with surgery and intravenous nutrition
2 hours

5 -Hemostasis and bleeding
surgical evaluation of patients operated in terms of bleeding
anticoagulation 1 hour

6 -Blood transfusion
Packcell/ Platelets/ other routine transfusions 1 hour

| | |
|---|---|
| 7 -Hemorrhagic shock | 2 hours |
| 8 -Shock, gram negative | 1 hour |
| 9 -General surgical infections | 2 hours |

## Thorax Surgery 9 hours

| | |
|---|---|
| 1 -General thorax Surgery | 1 hour |
| 2 - thorax Trauma (including high velocity and war lesions) | 2 hours |
| 3 -Hydatid cyst | 1 hour |
| 4 -Diaphragm diseases | 1 hour |
| 5 -Mediastinal tumors | 1 hour |
| 6 -Lung cancers | 1 hour |
| 7 -Cardiac surgery | 1 hour |
| 8 -Large vascular surgery | 1 hour |

## Surgery and Gastroenterology Diseases — 39 hours

| | |
|---|---|
| 1 -Esophagus | 4 hours |
| 2 -Stomach and duodenum | 4 hours |
| 3 -Pancreas | 2 hours |
| 4 -Gall bladder and bile ducts | 3 hours |
| 5 -Liver disease | 3 hours |
| 6 -Intestinal obstruction | 2 hours |
| 7 -Small intestinal surgical disorders | 1 hour |
| 8 - Large intestinal surgical disorders | 2 hours |
| 9 -Rectum and anus surgery diseases | 2 hours |
| 10 -Tumors of the Colon | 2 hours |
| 11 -Appendicitis | 2 hours |
| 12 – Peritoneum and peritoneal Cavity peritonitis ( including TB peritonitis), acute perforation of visceral organs, | |

| | |
|---|---|
| hernias | |
| | 3 hours |
| 13 -Spleen diseases | 1 hour |
| 14 -Portal hypertension | 2 hours |
| 15 -Gastrointestinal bleeding | 2 hours |
| 16 - abdominal Trauma<br>abdominal bleeding<br>blunt trauma<br>penetrating trauma | |
| | 4 hours |

## Surgery and Endocrinology — 5 hours

| | |
|---|---|
| 1 - thyroid and parathyroid | 4 hours |
| 2 - adrenal glands Diseases | 1 hour |

## Other surgeries — 15 hours

| | |
|---|---|
| 1 -facial and jaw Malformations | 2 hours |

| | |
|---|---|
| 2 -Tumors of the head and neck ( salivary glands, etc. ) | 2 hours |
| 3 - breast Tumors, benign and malignant | 4 hours |
| 4 – surgery of larynx and pharynx | 3 hours |
| 5 -Soft tissue skin tumors | 3 hours |
| 6 -Head and neck trauma | 1 hour |
| 7 -Burns | 4 hours |

## Surgery and Nervous system 12 hours

| | |
|---|---|
| 1 -Head Trauma management, evaluation and types of bleedings | 2 hours |
| 2 - spinal cord Trauma management, evaluation and types of bleedings | 1 hour |
| 3 -vascular disorders and arterial7venous Lesions of the brain | 1 hour |
| 4 -Congenital diseases of the brain and spinal cord | 2 hours |
| 5 -Brain tumors | 2 hours |
| 6 -Herniated disc | 1 hour |
| 7 -Spinal tumors | 1 hour |

| | |
|---|---|
| 8 -Neuroradiology | 1 hour |

## Genitourinary system surgery 14 hours

| | |
|---|---|
| 1 -Examination of the patient and examination of the urinary tract | 1 hour |
| 2 -Genitourinary Tumors | 4 hours |
| 3 -urolithiasis | 1 hour |
| 4 -obstructions and stenosis of Genitourinary | 1 hour |
| 5 - urinary tract Infections | 2 hours |
| 6 - Genitourinary Abnormalities | 1 hour |
| 7 -Urethritis | 1 hour |
| 8 -Scrotal diseases | 1 hour |
| 9 - Urology Emergency | 1 hour |
| 10 - Genitourinary Trauma | 1 hour |

# Pediatric Surgery 9 hours

| | |
|---|---|
| 1 -Vomiting in the first months of life | 1 hour |
| 2 -Abdominal pain in children | 1 hour |
| 3 -Obstruction and other duodenal intestinal disorders | 1 hour |
| 4 -Hirschsprung | 1 hour |
| 5 - Wilms Tumor | 1 hour |
| 6 -Neuroblastoma | 1 hour |
| 7 -Pediatric surgery emergencies | 1 hour |
| 8 - common Surgeries in children | 1 hour |
| 9 -Time of surgery in pediatric surgery | 1 hour |

## Vascular surgery 14 hours

| | |
|---|---|
| 1 -Aortoiliac vascular | 1 hour |
| ۲- femoropopliteal vascular | 1 hour |
| 3 - visceral arteries and veins | 1 hour |
| 4 -intracranial vascular disorders | 1 hour |
| 5 -Aneurysms of the aorta and peripheral visceral aneurysms | 2 hours |
| 6 -Burger disease | 1 hour |
| 7 -Angio-spastic diseases | 1 hour |
| 8 -Arterial embolism | 1 hour |
| 9 -Vascular trauma including penetrating and high velocity trauma | 2 hours |
| 10 – varicose, Diseases of peripheral venous and lymphatic system, chronic venous failure, acute thrombophlebitis, pulmonary embolism, obstruction of superior vena cava | 2 hours |
| 11 - Thoracic outlet syndrome | 1 hour |

# Anesthesia

11 hours

1 -Evaluation of patients before the operation
General examination to determine risk in patients with cardiovascular diseases, diabetes and pregnancy, premedications in anesthesia, sensitivity to medications, NPO protocols 2 hours

2 - preoperative respiratory test to determine the risk of surgery management of complications, respiratory failure, chronic tobacco consumption, smoking history evaluation, sputum tests, clinical risk assessment 2 hours

3 – anesthesia clinical applications:

A anesthesia in surgical procedures mechanism of the effect of medications stages of anesthesia

2 hours

B. activities in respiratory care unit, neurosurgery patients

2 hours

C. pain management pathophysiology and study in the pain management practical application and everyday pain management

1 hour

4 -intoxications, adults' respiratory suffer syndrome, Aspiration
Respiratory complications after the surgery

2hours

5 - cardiopulmonary Resuscitation basic and advanced 2 hours

## Orthopedics surgery: 29 hours

1-Examination of joints and bones and examine the patient in terms of orthopedic 2 hours

2 -Definition of fracture classification of fracture signs of clinical definition of dislocation investigate fracture in emergency

2 hours

3 -Mechanisms to improve healing and recovery of bone, tendon and ligament injuries delayed healing of fractures- bone welding bone grafts

1 hour

4 -open fracture

Early management

Proper management of wound on an open fracture

Approach to open fracture and fractures limb

1 hour

| | |
|---|---|
| 5 -Complications of fractures<br>fat embolism, gas gangrene, tetanus, osteomyelitis, ischemic syndrome | 1 hour |
| 6 -Fracture and dislocation of the wrist,<br>fracture in the bones of the forearm | 1 hour |
| 7 -Fractured arm and shoulder and dislocation of the shoulder | 1hour |
| 8 -Fractures and dislocations of the vertebrae | 1 hour |
| 9 -Pelvic fractures | 1 hour |
| 10 -Fractures and dislocations joint and bone of the hip | 1 hour |
| 11 -Fractures, dislocations, and ligament injuries of the knee | 1 hour |
| 12 -Fracture and dislocation of the wrist, foot, tibia, and fibula | 1 hour |
| 13 -Types of amputation and related procedures and indications | 1 hour |
| 14 -The cause and mechanism of infections in bone, joint, osteomyelitis, acute and chronic<br>purulent arthritis | 1 hour |
| 15 -TB bone and joint syphilis, bones and joints ( infections, fungal chopped) | 1 hour |
| 16 -Congenital dislocation of the hip joint | 1 hour |
| 17 -Club foot<br>metatarsus varus<br>congenital Hallux valgus/varus | 1 hour |

18 -Other congenital abnormalities of bone and joint Sprengel, Syndactyly, Macrodactyly, etc. 1 hour

19 -Tumors of skeletal and nonskeletal origin 1 hour

20 - progressive Myositis ossificans, muscular tumors 1 hour

21 - compartment Syndrome (anterior and posterior) carpal tunnel Syndrome 1 hour

22 -Poliomyelitis - cerebral palsy 1 hour

23 -Orthopedics in other musculoskeletal diseases 2 hours

24 -Aseptic necrosis of hip in children hip joint osteoarthritis in adults (aseptic necrosis of femur head and epiphysis slip) 2 hours

25 - dissecans osteochondritis, congenital patellar dislocation 1 hour

26 - Shoulder muscular and tendon Lesions, frozen shoulder, painful arc, tennis and golf Elbow 1 hour

# Pediatrics diseases rotation

for medical students- Clerkship stage

Course duration: 3 months

Number of credits :

- Applied clinical: 9
- Theoretical: 6

Clinical Syllabus comes further in the clinical curriculum chapters

Theoretical Sessions 102 hours

Prerequisite: None

# Syllabus of Pediatrics diseases clerkship theoretical sessions

| | |
|---|---|
| 1 -Normal Neonate | 2 hours |
| 2 - Premature C Small-for-Gestational-Age (SGA) and LGA | 1 hour |
| 3 -Caring steps for a normal newborn | 1 hour |
| 4 -Caring steps and management of a preterm newborn | 1 hour |
| 5 - Neonatal Asphyxia, neonate breathing problems, complications resulting from oxygen therapy | 2 hours |
| 6 -Infantile and neonatal Resuscitation | 1 hour |
| 7 -Pathophysiology, etiology, and treatment of infantile jaundice | 3 hours |
| 8 -Growth and developmental disorders – from fetal stage to adolescence | 3 hours |
| 9 -Nutrition (food and vitamins) in infants and children | 2 hours |
| 10 -Maternal breast feeding | 1 hour |
| 11 -Alternative Feeding infants and children (including special feeding protocols) | 2 hours |
| 12 -Malnutrition | 2 hours |

13 -Chronic Diarrhea
Malabsorption syndromes 2 hours

14 – Avitaminosis 1 hour

15 -Public Health and Preventive Medicine in children 4 hours

16 -Infantile infectious diseases 2 hours

17 -Intrauterine infections 1 hour

18 -Diarrhea , vomiting and dehydration with emphasis on prevention 3 hours

19 -fluid and electrolytes with special attention to treatment with ORS 2 hour

20 - common genetic and metabolic Diseases 2 hours

21 -Specific issues of the nervous and muscular system in infants and children

Floppiness/hypotonia – Floppy infant Syndrome 2 hours

22 -Meningitis and encephalitis 2 hours

23 -Seizures in infants and children 1 hour

24 -Tuberculosis 2 hours

25 -Bordetella Pertussis 1 hour

26 -Diphtheria 1 hour

| | |
|---|---|
| 27 -Tetanus | 1 hour |
| 28 -Polio, its prevention and national eradication protocol | 1 hour |
| 29 -Measles | 1 hour |
| 30 -Rubeola, Chicken Pox and Other acute diseases with skin rash in children (other than measles ) | 1 hour |
| 31 -Mumps | 1 hour |
| 32 -Hepatitis : Causes and effects of the infants and children | 1 hour |
| 33 -Typhoid | 1 hour |
| 34 -Brucellosis | 1 hour |
| 35 -Urinary tract infections | 1 hour |
| 36 -Common parasitic diseases in children | 2 hours |
| 37 -Upper Respiratory tract Infections | 2 hours |
| 38 - Lower Respiratory tract Infections | 3 hours |
| 39 -Asthma | 2 hour |
| 40 -Acute glomerulonephritis and acute nephrotic syndrome | 1 hour |

41 -Common abnormalities in Cardiovascular system including Congenital Cardiac Syndromes
Congenital Heart Defects (CHDs)

- Atrial Septal Defect /Ventricular Septal Defect
- Coarctation of the Aorta
- Truncus Arteriosus
- Hypoplastic Left Heart Syndrome
- Pulmonary Atresia/ Tricuspid Atresia
- Tetralogy of Fallot

Infantile cardiac failure 3 hours

42 -Rheumatism acute joint 1 hour

43 -Juvenile arthritis rheumatoid
Systemic lupus erythematosus (SLE) 1 hour

44 -Acute Osteomyelitis, Cellulitis 1 hour

45 -Acute arthritis 1 hour

46 -Allergy in children and infants
Fool intolerances
Pharmaceuticals and medications indications and contraindication 1 hour

47 – common dermatologic diseases in infants and children 1 hour

48 -Diabetes in children and infants 2 hours

49 -Hypothyroidism in infants and children
Screening national neonatal protocols and early clinical manifestations 1 hour

50 -Disorders of the metabolism of calcium and vitamin D in neonates and infants with rickets, Hypocalcemia 2 hours

51 -Genitourinary disorders of infants and neonates with emphasis on ambiguous Genitalia, 1 hour

52 -Hematologic disorders, with emphasis on Hemophilia its diagnosis and management 1 hour

53 -Heart failure in infants and children 1 hour

54 -Anemia in infants and children algorithmic approach to diagnosis and management 2 hours

55 -Shock and coma 1 hour

56 -Emergencies, poisonings, and their prevention principles 1 hour

57 -Common malignant Diseases in infants and children

Including newborn screenings and alarm signs 2 hours

58 -Common psychological and behavioral disorders in children problems in the education of children, psychological evaluations of children and approach to mental retardation 2 hour

59 -The effect of pharmaceuticals and medications on the fetus and infant 1 hour

60 -Abdominal Mass in children and infants 1 hour

61 -Two-sided relationship and effect between and the mother and the fetus 1 hour

62 -Respiratory diseases and its management in newborns 1 hour

63 -Common metabolic disorders in infants (other than calcium) 2 hours

64 -algorithmic approach to low height in children 1 hour

65 -Muscular diseases in children 2 hours

66 -Hypertension in children 1 hour

67 -Vomiting in newborns, infants, and children algorithmic approach to examination, diagnosis, and management 1 hour

69 -misperceptions and misbeliefs in context of maternal breastfeeding 0.5 hours

69 -Social Support and family support of breastfeeding mothers 0.5 hours

# Gynecology and Obstetrics

for medical students- Clerkship stage

Number of credits:

- Applied clinical: 6
- Theoretical: 4

Applied Clinical rotation in Clerkship: 2 months

Clinical Syllabus comes further in the clinical curriculum chapters

Theoretical course Sessions 68 hours

Prerequisite: None

Syllabus of Gynecology and Obstetrics theoretical course:

## A: Obstetrics and Childbirth

| | |
|---|---|
| 1 -Definition of midwifery science and vital statistics | 1 hour |
| 2 -brief review of applied Anatomy of Genital organs | 1 hour |
| 3 -Menstrual and ovulation physiology | 1 hour |
| 4 -multicellular stages formation, nesting, placenta, and membranes | 1 hour |
| 5 -Placental physiology | 1 hour |
| 6 -Symptoms and applied methods of diagnosing pregnancy | 1 hour |
| 7 -Embryology emphasis on different stages of embryonic development and the amount of amniotic fluid | 1 hour |
| 8 -Clinical examination of the uterus and taking maternal history | 1 hour |
| 9 -Physiological changes during pregnancy | 2 hours |
| 10 -Pelvic anatomy and its subtypes | 1 hour |
| 11 Definition and assessment of:<br>-Presentation<br>-position<br>-Station<br>-engagement | 1 hour |
| 12 -Protocols of Care during pregnancy and approach to common complaints of the pregnancy (including morning sickness) | 2 hours |
| 13 -Physiology of labor and its signs | 1 hour |
| 14 -The natural course of childbirth and how to perform natural childbirth | |

1 hour

15 -Care after the delivery 1 hour

16 -Delivery presentations 1 hour

17 – Presentations of Delivery: occipital lobes , posterior , forehead , face and shoulders1 hour

18-Induction of labor 1 hour

19-Dystocia in labor (pathological contractions, pelvic and anatomic reasons, macrosomia, Malformations , presentation causes, etc.)

2 hour

20 -Fetal Suffering and Fetal Health evaluation Methods 1 hour

21 - preterm Labor, post-term Labor 1 hours

22 -Delayed intra-uterine growth 1 hour

23 -Pregnancy of twins or Multiple pregnancy 1 hour

24 -Bleedings in thirds trimester of pregnancy (placenta detachment, placenta previa ) 2 hours

25 -Types of placenta and placental abnormalities and umbilical cord 1 hour

26 -Complications after the birth Infection, bleeding, thrombophlebitis, and breast problems 2 hours

27 -Blood Type mismatch 1 hour

28 -Trophoblastic diseases 2 hours

29 -Vacuum and forceps 1 hour

30 -Cesarean section and its indications, Indications of hysterectomy after the birth 2 hours

31 - Amniotic Fluid Problems Hydramnios/Oligohydramnios

Fetal malformations and disorders (hydrocephalus, anencephaly, meningocele, etc.) 2 hour

32 - Hypertensive Disease in pregnancy 2 hours

33 - premature amniotic membrane Rupture 1 hour

34 -cardiac disease and urinary system disorders in pregnancy 1 hour

35 -Diabetes and pregnancy 1 hour

36 -Abortion 1 hour

37 - Extrauterine Pregnancy 1 hour

38 -Resuscitation of the newborn 1 hour

# B Gynecology

39 -Clinical examinations and paraclinical evaluations in gynecological diseases 1 hour

40 -Puberty and menopause 1 hour

41 -Dysmenorrhea 1 hour

42 -Vulva and Vaginal diseases 1 hour

43 -Vaginitis and Cervicitis 1 hour

44 - Benign diseases of the uterus (including polyps and Hyperplasia) 2 hours

45 - Malignant diseases of the Cervix including the preparation and interpretation of smears and biopsies 1 hour

46 -Malignant diseases of the Uterus and Fallopian tubes 1 hour

47 -Benign ovarian tumors 1 hour

48 -Malignant ovarian tumors 1 hour

49 -Abnormal bleedings and menstruation signs 1 hour

50 -Pelvic infections 1 hour

51 -Amenorrhea 2 hours

52 -Infertility 2 hours

53 -Endometriosis 1 hour

54 - Tuberculosis and genitourinary system 1 hour

55 -Congenital malformations of the genital organs 1 hour

56 - pregnancy prevention methods with emphasis on the role of the mother in the prevention of pregnancy and national protocols 2 hours

# Ophthalmology

for medical Clerkship students

Course duration: 1 month

Number of credits: 3 credits

**Essential and core topics and syllabus in clerkship rotation:**

1 -Anatomy and physiology of the eye:

Cornea, eyelids,
Lacrimal ducts,
nerves and muscles of the eye ,
and the Orbit

2 -General Ophthalmic Physical Examination:

Anterior segment,
Posterior Segment and retina
Eye mobility and coordination between the two eyes

3 -Common medications and pharmaceuticals in ophthalmology
effects of systemic medications on the eye
with emphasis on systemic corticosteroids

4 -Common Ocular disorders:

conjunctival and tear film,
diseases of the cornea
disease of the Sclera
Optic nerve and its disorders,
the lens and its disorders

5 -Refractive Errors, its types, algorithmic approach in diagnosis and managements

6 -Strabismus Diagnosis and Management

7 -Glaucoma in adults and children
alarm signs and competency in diagnosing emergency cases,

first steps and indications to be referred.

8 -Ophthalmic Emergencies:

Exposure to alkaline and acidic fluids,
trauma. Lacerations, and rupture of the eye
Thrombotic events and disorders of the eye
Ophthalmic sign and symptoms of poisoning,
diagnostic radiology and imaging in orbital fractures and facial trauma
Ocular Foreign Object algorithmic approach to management

9 - Headaches and eyes

10 - common effects of systemic diseases on the eye
with emphasis on

Diabetes,

Hypertension,

and systemic diseases with ophthalmic presentations

# Otorhinolaryngology Diseases rotation

for medical Clerkship students

Course duration: 1 month

Number of credits : 3

**Essential and core topics and syllabus in clerkship rotation:**

1 -Anatomy and physiology of the ear , Audiometry

2 -Diseases of the ear

- External ear, and tympanic membrane,
- Otitis media and its complications,
- Diseases of the internal ear,
- Hearing disorders and its differential diagnosis,
- Tinnitus, algorithmic approach to differential diagnosis and management
- Rehabilitation of the hearing disorders,
- Dizziness and Vertigo, algorithmic approach to differential diagnosis and management

- Speech disorders in children, algorithmic approach to diagnosis and management
- Diseases of the seventh and eighth cranial nerve

3 -Head and neck

Surgical approaches and their indications: Maxillofacial complex Surgery, Fractures of the bones of the face Deep cervical infections, differentiated diagnosis of cervical tumors, reconstructive surgeries of head, face and neck , diseases of the salivary glands

4 -Nose:

Physiology and anatomy of the nose
Physiology and anatomy of the sinuses , diseases of the nose
Algorithmic approach to diagnosis and treatment of Sinusitis

5 -Anatomy, physiology and diseases of the mouth and teeth, tonsils, and adenoids
Pharynx and Larynx

6 -Larynx : Anatomy and physiology , laryngeal diseases algorithmic approach in critical cases

7- Bronchospasm anatomy and physiology,

8- esophageal and tracheal diseases,

9- competency in different methods of administrating Airway tracheotomy and patient care,

# Psychiatry

for medical students- Clerkship Stage

Course duration: 1 month

Number of credits : 3

## Practical Learning and activities

in medical clerkship Psychiatry rotation:

organization and public activities of a psychiatric department:

Each psychiatric section in a general hospital or in a comprehensive psychiatric center should have a suitable number of faculty member psychiatrists, clinical psychologist, social workers and nursing and medical staff.
In terms of responsibilities, for each 10 hospital beds, a “therapeutic-educational team” under the supervision of a Psychiatry professor is formed. It is considered as the psychiatric functional unit; including a clinical psychologist, a social worker, presences of responsible person for occupational therapy, the relevant nursing staff and medical students and paramedics and interns and assistants.

Main activity in this section includes individual psychiatric evaluation and interview of patients admitted by department team (including students, interns, and residents under supervision of psychiatrist responsible) and then a comprehensive evaluation of patients in team works.

further clinical activities in which medical students are involved are as follows:

- Bedside interviews and sessions,
- Clinical department rounds and grand rounds,
- theoretical classes,
- outpatient therapy (psychotherapy),
- the sessions of family therapy group,
- shock therapy ECT,
- psychological tests and evaluations,
- emergency psychiatric visits, interviews, evaluation, and management in emergency ward or emergency department of Roozbeh psychiatry hospital
- Psychiatric counseling and communication with other specialized clinical departments
- special interview and feedback meetings for students in clinical subsets to familiarize with patients' reaction and acceptance of illness, and become familiarized with their natural and abnormal reactions in dealing with patients and other feedback (raising self-knowledge in students)

## Theoretical education:

Medical Students in their clerkship rotations, will have about 20 hours of the theoretical sessions in the psychiatric department.

Number of credits : 2

Course Type: Theoretical 34 hours

## Main core syllabus

of theoretical sessions in clerkship rotation includes:

| | |
|---|---|
| 1 -Definition, and scope of application in psychiatric practice | 1 hour |
| 2 -Neurochemistry and neurophysiology of behavior | 1 hour |
| 3 -Emotions and stress | 1 hour |
| 4 - different theories in the structure of the psyche and development of psyche | 2 hours |
| 5 -Defense mechanisms | 1 hour |
| 6 -Principles of interviewing and clinical evaluation in psychiatry | 1 hour |
| 7 -Semiology and Symptoms of psychiatric disorders | 1 hour |
| 8 -Taking a history and examining the patient's mental state | 1 hour |
| 9 -Classifications of psychiatric disorders | 1 hour |
| 10 -Basics of psychopharmacology and organic therapies in psychiatry | 1 hour |
| 11 -Schizophrenia group disorders | 2 hours |
| 12 -Mood disorders | 2 hours |
| 13 -anxiety disorders | 2 hours |

14 -Disorders related to stress and traumas 1 hour

15 -Conversion disorders 1 hour

16 -dissociative identity disorders, multiple-personality disorders 1 hour

17 - hypochondria and somatization 1 hour

18 -Disorders of Personality

- Antisocial personality disorder.
- Avoidant personality disorder.
- Borderline personality disorder.
- Dependent personality disorder.
- Histrionic personality disorder.
- Narcissistic personality disorder.
- Obsessive-compulsive personality disorder.
- Paranoid personality disorder.

2 hours

19 -Psychiatric disorders following organic brain damages 1 hour

20 -Psychosomatic disorders 1 hour

21 -Brain and sexual behavior, physiological sexual responses, different stages of sexual behavior 1 hour

22 -Sexual disorders and sexology 2 hours

23 -substance abuse and dependencies 2 hour

24 -Principles of Child Psychiatric Examination 1 hour

25 – essentials of children psychiatry 2 hours

26 - Familiarity with different methods of cognitive behavioral therapies in psychiatry 2 hours

# Intoxications
# Forensic Medicine
# and Occupational Medicine

for medical students- Clinical Clerkship Stage

Number of credits: 2

Unit Type: Theoretical 34 hours

Prerequisite : None

## Main core syllabus

of theoretical sessions in clerkship rotation includes:

1 -principals of forensic medicine
principles of occupational medicine 1 hour

۲-Principles of medical ethics
Medical practice rules and regulations (Law articles) 3 hours

3 - Forensic aspects of death 3 hours

4 - Identification and identity application of human remains and traces 3 hours

5 -Suffocations 2 hours

6 -Forensic medicine and Sexual issues 3 hours

7 -Traumatology:

General and assault and physical harm 2 hours
Traumas and accidents 2 hours
Frost bite and heat trauma 2 hours
Radiation and electricity 1 hour
Noise and auditory trauma 1 hour

8 -Intoxication and Poisoning:

Poisoning by cyanide, arsenic, derivatives of mercury 1 hour
Poisoning by medications and pharmaceuticals 2 hours
Poisoning with animal toxins and biologic toxins 2 hours
Poisoning with derivatives of oil and petrolium 1 hour

| | |
|---|---|
| Poisoning by carbon monoxide | 1 hour |
| Poisoning with insecticides | 1 hour |
| Poisoning with lead | 1 hour |
| Poisoning with benzene (solvent) | 1 hour |
| pneumoconiosis (Risks of dust: industrial and environmental) | 1 hour |

9- Indications of admission following intoxication

- Algorithmic approach to intoxicated patient
- Algorithmic approach to unconscious patient
- Indications of Dialysis in intoxicated patient 2 hours

# Public Health 5

## Epidemiology of common diseases

in Iran and the world

Number of credits: 2

Type of unit: theoretical

Prerequisite : previous public health courses

Main core syllabus
of theoretical sessions in clerkship rotation includes: 34 hours

Definition of Epidemy and Pandemics

A brief review of main epidemics and pandemics in Iran and global scale

Health network in Iran and active national and international surveillance programs

- Epidemiology and control of malaria
- Epidemiology and control of leishmaniasis
- Epidemiology and tuberculosis control
- Epidemiology and control of leprosy
- Epidemiology and control of typhoid
- Epidemiology and control other contagious intestinal feverish diseases
- Epidemiology and control of viral hepatitis with emphasis on prevention of Hepatitis B and C
- Epidemiology and control of parasites transmitted through soil Ascaris - hook worm - trichocephalus
- Epidemiology and control of Amebiasis and giardiasis
- Epidemiology and control of diarrheal diseases
- Epidemiology and control of brucellosis
- Epidemiology and control of cholera
- Epidemiology and control of rabies

Epidemiology and control of Noncommunicable diseases (NCDs)

- Main concerns, approaches, millennium objectives and goals

- Epidemiology and control of cancers
- Epidemiology and control of diabetes
- Epidemiology and control of arterial blood pressure
- Epidemiology and control of ischemic heart disease
- Epidemiology and control of Chronic respiratory diseases

# Public Health 1

Principles of Health Services

Number of credits : 2

course Type : Theoretical 24 hours

prerequisite : none

General **definitions and concepts of health,** the general scope of activities of the Public Health **spectrum of health status** 2 hours

Health and well-being in regional and religious contexts 1 hours

**current issues of health care** in Iran and east Mediterranean region and how to determine the needs of health care in communities, urban and rural and the importance of primary health care 2 hours

Principals of **primary health care** 2 hours

**Health education and promotion** in various contexts. health and treatment programs and its effect on people's participation in these services 2 hours

**Environmental Health** including infrastructural aspects such as the supply of healthy and adequate water , improving the **KPIs in contagious and oral fecal diseases**, **regional epidemics**, regional disease controls by means of food supply chain improvement

improvement of production and distribution and Consumption of food standards
**Air pollution and disease attributed to the pollution of air** 2 hours

**Principles of maternal care**
and special protocols regarding **mothers and children**
(before the age of school and later in the school age)
with emphasis on the population and Spacing between births and the maternal breast feeding

2 hours

-National Programs
in **eradication and elimination of common and endemic diseases** 2 hours

**Immunization against infectious diseases**
protocols, indications, national and international **vaccination plans/charts** 2 hours

Principles of **occupational health** including diseases caused by the **work, and in the work environment**,
with emphasis on laws and regulations, and the principles and methods of **prevention in occupational diseases**

4 hour

- **World and Iranian health care delivery systems** and international organizations 2 hours

- Different levels of providing health care services in the country 2 hours

- Management, planning and evaluation of health care services in Iran 2 hours

# Public Health 2

principles of epidemiology and fight with disease

Number of credits : 2

course Type : Theoretical 34 hours

prerequisite : Principles of health services 1

## Main core syllabus

of theoretical sessions in clerkship rotation includes: 34 hours

**Definition** of epidemiology, ecological approach to diseases 1 hour

**common terminologies in epidemiology** 1 hour

**pathogenesis Factors** physical, chemical and biological 4 hours

Host factors 1 hour

**Environmental Factors** physical-chemical, socio- biological 1 hour

**Prevention and preventive healthcare** 2 hours

**Epidemiological and clinical Studies** 3 hours

**Epidemics and how to study them**
(how to collect information , classify and display them by time, place and person)
**applications of bio-statistics in epidemiology** 6 hours

Epidemiology and control of **preventable disease** (national Program of Immunization)

6 hour

- principles of six disease preventable diseases by vaccination in national elimination program and mechanism of immunity (innate and acquired) 2 hours

Principles of **occupational health** including diseases caused by the **work, and in the work environment**,
with emphasis on laws and regulations, and the principles and methods of **prevention in occupational diseases**

4 hour

- **World and Iranian health care delivery systems** and international organizations

2 hours

**Vaccination and immunization**
Vaccine types, manufacturing, maintenance (cold chain) and its administrations

2 hours

- How to set up and run a **vaccination center** and carry out the vaccination program and how to **evaluate the practical program IPE** 2 hours

# Public Health 3

family Health, population, and demography

Number of credits : 2

Unit Type : Theoretical 24 hours

Prerequisite : Principles of public health 1 and 2

Course Title :

1 -General ecology of human (definition and scope of studies and issues arising in the ecology of human, environment, biology Human)

1 hour

2 -Human social environment (definition of society, community and population with emphasis on the importance and role of family and household in weaving and construction Social ) 1 hour

3 -General demographic (population and structure of the population , trends in the population

1 hour

4 -Demographic policies and family planning 1 hour

5 -Definition and scope of comprehensive family health services 1 hour

6 -Factors important in the health of families and their longitudinal process in Iran and the world (fertility rate, marriage , death and mortality rate, M I NMR, human development index, Life expectancy at birth and at 60) and Population growth rate and its changes 2 hours

7 -Health and care of before the marriage and before the period of pregnancy and preparation for breastfeeding

1 hour

8 - pregnancy, symptoms of pregnancy , health and care during pregnancy and preparing the mother for breastfeeding success and impact of the The health of the mother and newborn and reduction of maternal and infantile mortality and morbidity 4 hours

9 -primary health care during delivery and after the delivery and during breast feeding

1 hour

10 -Pregnancies and babies at risk (or probability of risk) 1 hour

11 - family adjustment and clinical aspects 2 hours

12- Health and care for babies of normal and premature and other newborns

13 - health care for naturally delivered babies with an emphasis on the room mother and the newborn, and the delivery unit adjusted to cultural context sensitivities 1 hour

14- health care premature and vulnerable for babies 1 hour

Epidemiology and control of diarrheal diseases 5 hours

15- Definition , importance, epidemiology and pathology of diarrheal diseases diarrhea resulting from E Coli, cholera and diarrhea Resulting from vibrio , diarrhea parasites and infections caused by Salmonella , Shigella, etc. 1 hour

16- Definition and types of dehydration and clinical assessment of its degrees (question of observation, turgor and weighing) 1 hour

- Treating diarrhea with regard to the prevention of dehydration treatment of dehydration (intravenous serum , sera food ORS And indications and how to administrate) and the role of breastfeeding, diet food, antibiotics and antidiarrheal drugs,

۲hour

- Breastfeeding, education, health, hygiene, food , improving the environment and fighting with flies in the prevention and control Diarrheal diseases 1 hour

Other important diseases 4 hours

- Overview on other diseases, infectious important common in Iran and the region and travel medicine and protocols with emphasis on

tuberculosis
Brucellosis
malaria

- Generalities on elliminated disease, particularly in Iran (rabies , leprosy and .....)

- Epidemiology and control of non-communicable diseases NCDs ( cancers , rheumatism and heart disease , accidents and poisonings , etc.)

# RADIOLOGY

for medical students- Clinical Clerkship Stage

Course duration: 1 month

Number of credits : 3

**Essential core topics and syllabus in clerkship rotation:**

1 -Principles of physical x- ray and the use of the medicine

radiology imaging, radiotherapy

2-Principles of Radiology x ray imaging:
including correspondence general radiography X-rays
in different positions(posteroanterior, anteroposterior, lateral , oblique etc.)

normal anatomical representations of the body organs and regions
head and neck , vertebrae column, pelvis,
chest (musculoskeletal, inner organs, normal cardiac and respiratory system representations)

Simple abdominal X-ray,
extremities and bones , joints ,
Medical devices including protheses and orthose, implants, pace makers, sutures etc.
digestive and gastrointestinal system,
genitourinary system,
cardiovascular including cardiac presentation in different ages, central and peripheral vessels, etc.)

3 -Different methods of diagnostic radiology imaging

simple Radiology,
radiography with contrast , oral and parenteral ,
such as the investigation of gastrointestinal system,
angiography, myelography etc.

4 -Principles of nuclear medicine,
indications and application of it in diagnostic approaches

5 - other diagnostic methods:

A ) Ultrasonography

with emphasis on emergency abdominal sonography and its interpretation

B ) CT Scan with emphasis on Chest CT scan and HRCT and Abdominal CT scan without contrast

Familiarity with principles, methodology and indications of

- Nuclear magnetic resonance (NMR)
- Position emission tomography ( PET )
- Digital subtraction angiography (DSR)

# DERMATOLOGY

for medical students- Clinical Clerkship Stage

Course duration: 1 month

Number of credits : 3 credits

**Essential Core Topics and Syllabus in clerkship rotation:**

1 -Principles of dermatology skin layers, its anatomy and physiology normal variations of skin appearance

2 -parasitic skin diseases

3 -Microbial skin diseases

4 -Viral skin diseases

5 -leprosy, tuberculosis, cutaneous cell diseases, sarcoidosis

6 -Superficial fungal diseases

7 - nonsuperficial fungal diseases

8 -Diseases caused by the radiation of the sun and UV exposure

9 -Blister diseases

10-Allergies and hypersensitivities

occupational allergies, occupational dermatitis

11- Skin benign and malignant disorders,

with emphasis on algorithmic approach in diagnosis and management of SCC, BSS, Melanoma diagnostic criteria
Dermatologic alarm signs

12-Skin diseases due to metabolic disorders

13- Autoimmune dermatologic diseases

with emphasis on Lichen planus, Psoriasis, Vitiligo, etc.)

15-STDs (sexually transmitted diseases)

with emphasis on algorithmic approach in diagnosis and management of

HSV and HPV Genital warts and condyloma acuminata, Molluscum contagiosum, Chlamydia and gonorrhea, Syphilis,
and scabies

15 - a summary of Immunology and dermatology, erythroderma, precancerous lesions, and paraneoplastic skin manifestations

# Public Health 4

## Medical statistics and research methods

Number unit: 2

Course Type: Theoretical 34 hours

Aims and Objectives:

1 -Familiarity of students with **common scientific research methods** in medical sciences

2 - Enable medical students to **collect and statistically express data and information**

3 -Familiarity of students with **statistical analysis and methods** in order to fully understand scientific peer reviewed publication

4 -Enable medical students to **perform research in basic medical and clinical domain**

Core Syllabus :

| | |
|---|---|
| 1 -The concept of research and its types | 2 hours |
| 2 -Different stages of a medical research | 2 hours |
| 3 -A variety of information methods of collecting data | 1 hour |
| 4 -Classify information and express it by table and diagram | 3 hours |
| 5 -Numerical description of information (central indicators and dispersion) | 3 hours |
| 6 -The concept of probability and the expression of its basic rules | 2 hours |
| 7 -Normal distribution and its application in medical sciences | 2 hours |
| 8 -Designing a medical study 1 | 2 hours |
| 9 -Sampling and its simple techniques | 2 hours |
| 10 -Confidence interval and descriptive parameters of a distribution | 2 hours |

11 - Designing a medical study 2
Hypothesis, H null and H one

statistical test,
first and second type error 3 hour

12 -main statistical tests
student T test, means comparison, Chi square, etc.
4 hours

13 -Causality vs. Correlation
The concept of correlation between two attributes and methods of investigation of the characteristics of quantitative and qualitative (coefficient of correlation zero to on

4 hours

14- statistically Evaluate a chosen medical paper/study 2 hours

# Infectious diseases

for medical students Clinical Rotations

Number of credits : 3

Course Type : Practical and Theoretical (51 hours theoretical)

## Core Syllabus

1 -Microbial virulence, pathogenesis of infections 1 hour

2-Fever Controlling mechanism and regulating the body temperature causes of fever , the importance of clinical fever, various types of fever , epidemiology of fever, febrile diseases, Definition of elongated fever

fever of unknown origin (FUO) 2 hours

3 -Defense Mechanisms of the bodyskin and mucus and secretions of the body , Hematologic- immunologic: Monocytes , lymphocytes and , macrophages , immunoglobulins, Complement factor system, interferons 2 hours

4 – serologic immunity responce : definition , antigen and antibody interaction with antigens, viruses, bacteria, fungi Mycoplasma , rickettsiae and parasites 1 hour

5 -Principles of treatment with antibiotic

identification of organisms ,
determination of antibiotic sensitivity
combination of antibiotics,
administration methods and response evaluations 3 hours

6 -Septic shock
damage caused by the shock to the cells ,
changes in hemodynamic ,
etiology and pathogenesis of symptoms 1 hour

7 -Epidemiology of infectious diseases 2 hours

8 - Gram positive cocci Infections
with emphasis on Streptococcus and Staphylococcus 2 hours

9 - Gram negative cocci Infections
with emphasis on meningococcal meningitis and gonococcal urethritis) 2 hours

10- Gram positive bacilli Infections
Listeria , anthrax 2 hours

11-Infection of the Gram negative bacilli
cholera , enterobacteria ,
Pseudomonas, Salmonella ,
Hemophilus, Shigella , Brucella 5 hours

12-Infections with spirochetes
syphilis , Leptospira 2 hours

13- Anaerobic Infections
tetanus , botulism , bacteroides 2 hours

14 -Mycobacteria : tuberculosis ( bacterial , how to diagnose skin test and culture, sputum sample taking protocols, vaccination , tuberculin testing , prevention and treatments in different settings and protocols) 4 hours

15 -Leprosy 1 hour

16 -Fungal infections 3 hours

17- protozoal Infections, amoeba, malaria , toxoplasmosis, leishmaniasis Giardia and Trichomonas 5 hours

18-Viral infections common cold and coronaviruses influenza and subtypes herpes simplex and herpes subtypes HPVrabies, pyogenic viruses including : poliomyelitis and coxsackie

Other Viral infections such as chicken pox , adeno-associated virus , hepatitis 5 hours

19-Mycoplasma infections ( pneumonia , urethritis ) 1 hour

20-Chlamydial infections ( trachoma , psittacosis , urethritis ) 1 hour

21-Rickettsiae infections ( typhus , Rocky Mountain ) 1 hour

22-Infections with parasitic worms (Ascaris , tapeworms , cystic hydatid , hookworms, Plasmodium falciparum and other common infections) 3 hours

# Annexes

Tehran University of Medical Sciences

School of Medicine

# Competency framework for medical graduates

## Tehran University of Medical Sciences

Approved buy
curriculum reform
committee
Of TUMS MD program