Islamic republic of Iran

Ministry of Culture and Higher Education

The Planning Council

# General specifications, program, curriculum

# Medical doctorate degree

# 1014

Adopted by the Seventeenth Meeting of Planning Council

1985.09.21

## Credits

There are 290 credits in medical doctorate degree which contain 152 credits of theoretical and 138 credits of semiology, training, internship and thesis.

1- General courses (23 credits)

2- Principle and basic courses (68 credits)

3- The second phase (30 credits)

4- Training (95 credits)

5- Internship and night shifts (68 credits)

6- Thesis (6 credits)

**Second chapter- program**

**A: General courses (Islamic culture, believes and general knowledge)**

**For all educational fields in bachelor degree.**

| | Title of courses | Credit | Hours | | |
|---|---|---|---|---|---|
| | | | Total | Theoretical | practical |
| 1 | Islamic studies (1) | 2 | 34 | 34 | |
| 2 | Persian (1) | 2 | 34 | 34 | |
| 3 | Foreign language (1) (theoretical, practical) | 2 | 51 | 17 | 34 |
| 4 | Physical education (1) (practical) | 1 | 34 | | 34 |
| 5 | Islamic studies (2) | 2 | 34 | 34 | |
| 6 | Islamic Ethics and Education (1, 2) | 3 | 51 | 51 | |
| 7 | Persian (2) | 2 | 34 | 34 | |
| 8 | Foreign language (2) (theoretical, practical) | 2 | 51 | 17 | 34 |
| 9 | Physical education (2) (practical) | 1 | 34 | | 34 |
| 10 | History of Islam | 2 | 34 | 34 | |
| 11 | Islamic revolution of Iran and its origin * | | | | |
| 12 | Islamic texts * | 4 | 68 | 68 | |
| 13 | General Biology * | | | | |
| | Total | 23 | 459 | 323 | 136 |

* - Every course in 11, 12 13 costs 2 credits and should be choose and pass 2 of them by medical students.

## B: Principle and basic courses

## Medical doctorate degree (The first phase: Basic Sciences)

| Course Code | The Title of course | Credit | Hours | | | Prerequisite |
|---|---|---|---|---|---|---|
| | | | Total | Theoretical | Practical | |
| 101401 | Medical Physics * | 2 | 38 | 30 | 8 | |
| 04 | Biochemistry | 6 | 119 | 85 | 34 | |
| 07 | Anatomy ** | | | | | |
| 07-1 | Anatomy | 3 | 68 | 34 | 34 | |
| 07-2 | Anatomy | 4 | 94 | 43 | 51 | |
| 07-3 | Anatomy | 3 | 77 | 26 | 51 | |
| 08 | Psychiatry | 2 | 34 | 34 | | |
| 14 | Health | | | | | |
| 14-1 | Public health 1 (principle of health care) | 2 | 34 | 34 | | |
| 14-2 | Public Health 2 (principle of epidemiology) | 2 | 34 | 34 | | |
| 18 | Medical terminology | | | | | |
| 18-1 | Medical terminology 1 | 3 | 51 | 51 | | 10 credits of general courses |
| 18-2 | Medical terminology 2 | 3 | 51 | 51 | | (18-1) |
| 25 | Principle of nutrition | 2 | 34 | 34 | | 04 |
| 27 | Histology | 4 | 85 | 51 | 34 | |
| 06 | Physiology *** | | | | | |
| 06-1 | Physiology 1 | 4 | 68 | 68 | | 04, 27 |
| 06-2 | Physiology 2 | 5 | 102 | 68 | 34 | (06-1) |
| 10 | Genetics | 2 | 34 | 34 | | 04, 27 |

## Continue of Principle and basic courses

| Course Code | The Title of course | Credit | Hours | | | Prerequisite |
|---|---|---|---|---|---|---|
| | | | Total | Theoretical | Practical | |
| 28 | Microbiology and virology * | 5 | 111 | 60 | 51 | (06-1) |
| 14-3 | Public Health (3) family health | 2 | 34 | 34 | | 14-1 |
| 34 | Immunology * | 3 | 60 | 43 | 17 | (06-1) |
| 31 | Parasitology and Mycology * | 4 | 94 | 43 | 51 | (06-1) |
| 42 | General Pathology **** | 5 | 111 | 60 | 51 | (06-2) |
| 43 | Embryology | 2 | 34 | 34 | | 27 |
| Total | | 68 | 1367 | 951 | 416 | |

*- These are theoretical-practical courses. Every one-hour theoretical is as equal as two-hour practical.

**- Anatomy 1 contains anatomy of chest, abdomen, male and female genitourinary system. Anatomy 2 contains anatomy of head, neck and central nervous system. Anatomy 3 contains anatomy of upper and lower extremities.

***- Physiology 1 contains physiology of cells, heart, circulation, respiratory and digestive system. Physiology 2 contains physiology of endocrine glands, kidney and body fluid regulation, arterial PH regulation, blood, nervous system.

****- Theoretical and practical hours in General Pathology are suggestive. It could be changed by educational group.

## Table of Basic sciences courses for medical students

| The first term | | | | |
|---|---|---|---|---|
| NO. | The title of course | credit | | Total |
| | | Theoretical | Practical | |
| 1 | Biochemistry | 5 | 1 | 6 |
| 2 | Histology | 3 | 1 | 4 |
| 3 | Medical Physics | 2 | - | 2 |
| 4 | Anatomy (1) | 3 | 1 | 4 |
| 5 | English language (1) | 2 | - | 2 |
| 6 | Persian | 2 | - | 2 |
| Total | | | | 20 |

| The second term | | | | |
|---|---|---|---|---|
| NO. | The title of course | credit | | Total |
| | | Theoretical | Practical | |
| 1 | Nutrition | 2 | - | 2 |
| 2 | Public Health (1) | 2 | - | 2 |
| 3 | Anatomy (2) | 2 | 1 | 3 |
| 4 | Physiology (1) | 4 | - | 4 |
| 5 | Genetics | 2 | - | 2 |
| 6 | Physical Education (1, 2) | 2 | - | 2 |
| Total | | | | 19 |

| The third term | | | | |
|---|---|---|---|---|
| NO. | The title of course | credit | | Total |
| | | Theoretical | Practical | |
| 1 | Anatomy (3) | 1.5 | 1.5 | 3 |
| 2 | Medical Terminology (1) | 3 | - | 3 |
| 3 | Physiology (2) | 4 | 1 | 5 |
| 4 | Public Health (2) | 2 | - | 2 |
| 5 | Islamic studies | 2 | - | 2 |
| 6 | Islamic Ethics and Education | 1 | - | 1 |
| 7 | Parasitology | 2.5 | 1.5 | 4 |
| Total | | | | 20 |

| The forth term | | | | |
|---|---|---|---|---|
| NO. | The title of course | credit | | Total |
| | | Theoretical | Practical | |
| 1 | Psychiatry | 2 | - | 2 |
| 2 | Public Health (3) | 2 | - | 2 |
| 3 | General Pathology | 4 | 1 | 5 |
| 4 | Immunology | 2.5 | 0.5 | 3 |
| 5 | Microbiology | 3.5 | 1.5 | 5 |
| 6 | Medical Terminology | 3 | - | 3 |
| Total | | | | 20 |

C: Specific courses

The second phase of Medical doctorate degree (Semiology and Physiopathology)

| Course Code | The Title of course | Credit | Hours | | | Prerequisite |
|---|---|---|---|---|---|---|
| | | | Total | Theoretical | Practical | |
| 101451 | Physiopathology | 14 | 238 | 238 | | |
| 51-1 | Gastrointestinal diseases | | 40 | 40 | | |
| 51-2 | Cardiovascular diseases | | 40 | 40 | | |
| 51-3 | Endocrine and metabolism diseases | | 32 | 32 | | |
| 51-4 | Hematology diseases | | 32 | 32 | | |
| 51-5 | Respiratory diseases | | 32 | 32 | | |
| 51-6 | Renal diseases | | 30 | 30 | | |
| 51-7 | Rheumatism diseases | | 32 | 32 | | |
| 64 | Specific Pathology * | 6 | 136 | 68 | 68 | |
| 65 | Pharmacology * | 4 | 77 | 60 | 17 | |
| 66 | Semiology * | 4 | 197 | 25 | 172 | |
| 67 | Health training ** | 2 | 136 | -- | 136 | |
| Total | | 30 | 784 | 391 | 393 | |

*- Semiology is a theoretical- training course which commences theoretical part for 25 hours from the first week of second phase. Then clinical semiology teaches in wards once a week.

**- Health training takes 3 weeks in health and treatment centers at the end of second or third year.

Important notice: General pharmacology should teach the first two weeks at the same time semiology teaches.

## The Third Phase (Clinical Training)

## The forth and fifth years

A: clinical

| NO | The title of course | Duration | credits | The wards during the training are passed |
|---|---|---|---|---|
| 1 | Internal Medicine | 6 months | 18 | General internal medicine, neurology, infectious diseases |

1- The training rotation in deferent wards would be programmed in medical school.

2- The time of general internal medicine ward must be at least 3 months and other wards time must not be more than 1 month.

3- If there is not any separable infectious or dermatology or neurology ward, the time of this ward will add to the time of general internal medicine ward.

| NO | The title of course | Duration | credits | The wards during the training are passed |
|---|---|---|---|---|
| 1 | Surgery | 4 months | 12 | General Surgery, urology, orthopedic |

1- The training rotation in deferent wards would be programmed in medical school.

2- The time of general surgery ward must be at least 2 months and other wards time must not be more than 1 month.

3- If there is not any separable urologic or orthopedic ward, the time of this ward will add to the time of general surgery ward.

| NO | The title of course | Duration | credits | The wards during the training are passed |
|---|---|---|---|---|
| 3 | Pediatric | 3 months | 9 | These trainings should pass after the Internal medicine and surgery wards.<br><br>* Medical students must pass rotationally the surgery training and 4 months of the Internal medicine training in the first 8 months of the training courses. It is necessary that the general internal medicine must be the main part of 4-monthly internal medicine training. |
| 4 | Obstetrics & Gynecology | 2 months | 6 | |
| 5 | Ophthalmology ** | 1 month | 3 | |
| 6 | Ear, Nose, Pharynx | 1 month | 3 | |
| 7 | Psychology | 1 month | 3 | |
| 8 | Radiology | 1 month | 3 | |
| 9 | Dermatology | 1 month | 3 | |
| | Total | 20 months | 60 | |

**- Theoretical of ophthalmology, ear, nose, pharynx, psychology and radiology would be taught for medical students in the same clinical ward every morning.

## Course table: Theoretical

| Course code | The title of course | Credit | hours | | | Prerequisite |
|---|---|---|---|---|---|---|
| | | | Total | Theoretical | Practical | |
| 14-4 | Medical statistics and research methodology * | 2 | 34 | 34 | | |
| 1 | Infectious diseases ** | 3 | 51 | 51 | | |
| 2 | Neurology diseases ** | 2 | 34 | 34 | | |
| 3 | Surgery diseases ** | 10 | 170 | 170 | | |
| 4 | Obstetrics and gynecology diseases ** | 4 | 68 | 68 | | |
| 5 | Pediatrics diseases ** | 6 | 102 | 102 | | |
| 7 | Psychology diseases ** | 2 | 34 | 34 | | |
| 68 | Forensic medicine and poisoning *** | 2 | 34 | 34 | | |
| 14-5 | Epidemiology of common diseases in Iran *** | 2 | 34 | 34 | | |
| 44 | Medical history and ethics | 2 | 34 | 34 | | |
| | Total | 35 | 595 | 595 | | |

*- Medical statistics and research methodology is taught in afternoon of the first 4 months of clinical training.

**- Theoretical of infectious diseases, neurology, surgery, obstetrics and gynecology, pediatrics, psychology diseases are taught in afternoon of the first 16 months of clinical training.

***- Forensic medicine and epidemiology are taught in afternoon of the last 4 months of clinical training.

## The Forth Phase (Clinical Internship)

| NO | The title of course | Duration | credits | The wards during the internship are passed |
|---|---|---|---|---|
| 1 | Internal Medicine | 4 months | 16 | General internal medicine |
| 2 | Surgery | 3 months | 12 | General Surgery, Urology, Orthopedic |

1-The internship rotation in deferent wards would be programmed in medical school.

1- The time of general surgery ward must be at least 2 months and other wards time must not be more than 1 month.

2- If there is not any separable urologic or orthopedic ward, the time of this ward will add to the time of general surgery ward.

| NO | The title of course | Duration | credits | The wards during the internship are passed |
|---|---|---|---|---|
| 3 | Pediatrics | 3 months | 12 | Medical school should hold all these courses for interns in all a-year duration.<br>* Duration of every optional course is one month. |
| 4 | Obstetric & Gynecology | 2 months | 8 | |
| 5 | Health | 1 month | 4 | |
| 6 | Ophthalmology<br>Ear, nose, pharynx<br>Psychology<br>Neurology<br>Dermatology<br>Infectious diseases<br>Cardiology | Optional courses<br>4 months. | 16 | |
| | Total | 17 months | 68 | |

## General courses

## For all educational fields in bachelor, master, medical doctorate degree

| | Title of courses | Credit | Hours | | |
|---|---|---|---|---|---|
| | | | Total | Theoretical | practical |
| 1 | Islamic studies (1) | 2 | 34 | 34 | - |
| 2 | Persian (1) | 2 | 34 | 34 | - |
| 3 | Foreign language (1) (theoretical, practical) | 2 | 51 | 17 | 34 |
| 4 | Physical education (1) (practical) | 1 | 34 | - | 34 |
| 5 | Islamic studies (2) | 2 | 34 | 34 | - |
| 6 | Islamic Ethics and Education (1, 2) | 3 | 51 | 51 | - |
| 7 | Persian (2) | 2 | 34 | 34 | - |
| 8 | Foreign language (2) (theoretical, practical) | 2 | 51 | 17 | 34 |
| 9 | Physical education (2) (practical) | 1 | 34 | - | 34 |
| 10 | History of Islam | 2 | 34 | 34 | - |
| 11 | Islamic revolution of Iran and its origin * | 2 | 34 | 34 | - |
| 12 | Islamic texts * | 2 | 34 | 34 | - |
| 13 | General Biology * | 2 | 34 | 34 | - |
| 14 | Computer * | 2 | | | |
| | Total | 23 | 459 | 323 | 136 |

* - Every course in 11-14 costs 2 credits and should be choose and pass 2 of them by medical students.

# Curriculum of Medical Doctorate Degree

# The first phase: Basic Sciences

# Medical Physics

Credits: 2

Theoretical- Practical

Prerequisite: None

Curriculum: (38 hours)

A- Physics of vision (10 hours)

1- Importance of visible light and optical properties, infrared, ultraviolet rays and their medical utilizations.

2- Physic study of eye, diagnosis and correction of anomalies

3- Astigmatism and its correction

4- View retina, visual field, vigilance, see colors, ophthalmoscopy

5- Seeing with the eyes, hyperopia, perception of salience of objects

6- Practical (1.5 hours)

B- Ultrasound waves and its medical utilizations (5 hours)

1- Produce ultrasound waves and their properties

2- Chemical and biological properties of ultrasound waves

3- Medical utilization of ultrasound waves

4- Practical (1.5 hours)

C- Medical utilization of the high-frequency: (5 hours)

1- Produce the high frequency and its properties.

2- Physiological properties and medical utilization of high frequency a- Electrical surgery b- thermal therapy

3- Electrical side effects on body and its ways to protect.

4- Practical (1.5 hours)

D- Nuclear medicine (8 hours)

1- Atom structure and nuclear energy

2- Radioactivity and its properties (ionizing radiations)

3- Natural radioactivity

4- Neutron, artificial radioactivity

5- Diagnose and measurement of radioactivity

6- Labeled molecules and its medical utilization

7- Utilization of radioisotopes in diagnosis and treatment

8- Practical (1.5 hours)

E- Physic principle of radiology and radiotherapy (10 hours)

1- Characteristics of X-rays and its properties

2- X-ray generators

3- X-ray absorption and its measurement

4- Physic principle of diagnostic radiation and radiotherapy

5- Radiobiology

6- Protection (X- rays, radiations)

7- Practical (2 hours)

# Biochemistry

Credits: 6

Theoretical- Practical

Prerequisite: None

Curriculum:

A- Theoretical (85 hours)
1- Introduction to Biochemistry and Biomolecular structure of human body
2- Carbohydrates chemical structure
3- Lipids chemical structure
4- Amino-acids and proteins chemical structure, water and PH
5- Nucleosides and free Nucleotides chemical structure
6- Vitamins and Co-Enzymes
7- Enzymes
8- Hormones (chemical structure, classification and mechanism of effect)
9- Biological oxidation, energy and electron transport chain
10- Cellular membrane and its transportation
11- Carbohydrates metabolism and their digestion and absorption
12- Lipids metabolism and their digestion and absorption
13- Proteins metabolism and their digestion and absorption, amino-acids metabolism
14- Nucleic acids and nucleotides metabolism
15- Nucleic acids, proteins biosynthesis and antibiotics effect
16- Blood chemical components
17- Water and electrolytes
18- Metabolic regulation
19- Nutrition

B- Practical (34 hours)
1- Introduction to laboratory equipments
2- Urine analysis
3- Blood analysis
4- Serum total protein determination and proteins electrophoresis
5- Some of serum enzymes assay
6- Determination of serum electrolytes and trace elements

# Anatomy 1

Credits: 4

Theoretical- Practical

Prerequisite: None

Curriculum:

A- Theoretical (43 hours)

1- Chest (12 hours) vertebral column, ribs, sternum, chest wall, lung, pleura, heart, mediastinum.

2- Abdomen (21 hours) abdominal wall, peritoneum, stomach, duodenum, liver, bile ducts, pancreas, intestine ( small intestine, large intestine, rectum, anal canal), large vessels and visceral vessels, abdominal sympathetic system, abdominal lymphatic, back muscles.

3- Male and female Genitourinary system (10 hours) kidneys, ureters, bladder, urethra in male, prostate, testis and vas deferens and seminal vesicle, ovaries, uterus, fallopian tubes, vagina, vulva, perineum.

B- Practical (51 hours)

Practical program is regulated by anatomy educational group.

# Anatomy 2

Credits: 2

Theoretical- Practical

Prerequisite: None

Curriculum:

A- Theoretical (34 hours)

1- Head and Neck Anatomy (20 hours)

Bones: Frontal, Ethmoid, sphenoid, Occipital, Parietal, face bones, base skull foramens, head and face cavities, vertebral column and ribs.

Head and Neck regions: superior and inferior hyoid muscles, carotid, jugular, vagus, carotid branches, submandibular gland, larynx, scalene, neck sympathetic, subclavian vessels, parotid gland, facial muscles, masseterotemporal region, pterygomaxillary region, maxillary and mandibular nerve, pharynx, oral cavity, nasal cavity, eye, ear, head and neck joints.

2- Central Nervous System (14 hours)

Neuron, synapse, embryology of central nervous system, spinal cord,

Rhombencephalon: medulla, pons, cerebellum, forth ventricle, midbrain,

Prosencephalon: diencephalon, telencephalon, internal structure of hemisphere, white matter of hemisphere, lateral ventricle, brain stem, Bisha fissure.

Meninges, Circulation in central nervous system

Autonomic nervous system, superficial sensory pathway, ascending sensory pathways, olfactory sensory system, taste sensory pathway, optic sensory pathway, auditory sensory pathway, vestibular pathway, motor pathways.

B- Practical (34 hours)

Practical program is regulated by anatomy educational group.

# Anatomy 3

Credits: 3

Theoretical- Practical

Prerequisite: None

Curriculum:

A- Theoretical (26 hours)

1- upper extremities (13 hours)

Osteology: clavicle, scapula, humerus, radius, ulna, wrist, hand, digits, glenoid fossa, anterior region of arm, scapular region, posterior arm, anterior and posterior forearm regions, hand, upper extremity joints.

2- lower extremities (13 hours)

Osteology: hip, femur, patella, tibia, fibula, foot, anterior femoral muscles and vessels, gluteal region, posterior femoral region, popliteal region, anterior and posterior leg, foot, lower extremity joints.

B- Practical (51 hours)

Practical program is regulated by anatomy educational group.

# Psychiatry

Credits: 2

Theoretical (34 hours)

Prerequisite: None

Curriculum:

1- Islamic view of human

2- Mind and psyche and their relations to psychiatry

3- Correlation between psychiatry and other sciences, its utilization in medicine

4- Psychiatric definition and field

5- Physiological principle of psychiatry

6- Islamic view of growth and development

7- Psychiatric view of growth and development

8- Perception and concentration

9- Consciousness status

10- Thinking and learning

11- Memory and amnesia

12- Tongue and thinking

13- Physiologic Provocation principle

14- To Provoke human emotions

15- Personality and its evaluation

16- Intelligence quotient

17- Conflict, adaptation and mental health

## Public Health 1 – Principle of Health Services

Credits: 2

Theoretical (34 hours)

Prerequisite: None

Curriculum:

- Definition and concepts of public health, field of public health
- Health in Islam
- Current situation of health and treatment in Iran, how to determine health needs in urban and rural societies, importance of primary health care.
- Important factors in primary health care
- Health teaching, philosophy and its ways
- Health teaching importance in different program and effect on public cooperation
- Environmental health (preparation of enough healthy water, water sanitation, water-borne diseases, characteristic of its epidemic, food-borne diseases, sanitation of food product and distribution, air pollution and air-borne diseases
- Mother and children Health care (health care in schools) and population, birth intervals.
- National program for control of common and endemic diseases
- Vaccination against common infectious diseases
- Occupational health, occupational diseases and their prevention (4 hours)
- Health services system in the world and Iran, international organizations (2 hours)
- Deferent levels of health services in health and treatment centers (2 hours)
- Management, planning and evaluation in Iranian health and treatment services (2 hours)

## Public health 2 – Principle of epidemiology and diseases control

Credits: 2

Theoretical (34 hours)

Prerequisite: Principle of health services

Curriculum:

- Definition of epidemiology, ecology of diseases

- Common terms in epidemiology

- Physical, chemical and biological virulent factors

- Host factors

- Physicochemical, environmental, biological and social factors

- Prevention and its levels

- Epidemiological studies

- Epidemic analysis: (data collection, classification, View by Time Location and person), statistics in epidemiology.

- Epidemiology and vaccination

<u>Expanding program of immunization (E.P.I) (6 hours)</u>

- Six preventable diseases by vaccination and immune mechanism (innate and acquired)

- Vaccination, production and preservation (cold chain) and its utilization.

- How to manage a vaccination center

- Evaluation of E.P.I.

<u>Epidemiology and control of diarrheal diseases (5 hours)</u>

- Definition, importance, epidemiology and pathology of diarrheal diseases (diarrhea due to E.coli, cholera, vibrio, parasite, salmonella and shigella infections)

- Definition and dehydration types and their degrees (question, observation, palpation and weighting) (1 hour)

- Treatment of diarrhea, prevention and treatment of dehydration (intravenous fluids, oral fluids like O.R.S. (Oral Rehydration Solution) and their reasons and utilizations), the role of breastfeeding, dietary regimen, antibiotics and antidiarrheal drugs. (2 hours)

- Prevention and control of diarrheal diseases, learning health, health food, environmental sanitation, prevention of diarrheal diseases with flies control (1 hour)

Other important diseases (4 hours)

- Common important infectious diseases in Iran (tuberculosis, brucellosis, malaria)

- Essential diseases in Iran (rabies, leprosy and so on)

- Epidemiology and control of non contagious diseases (cancers, rheumatism, cardiovascular diseases, accidents, poisonings and so on)

# Medical Terminology 1

Credits: 3

Theoretical (51 hours)

Prerequisite: foreign language 2

Curriculum:

The text for this course is the textbook "Physiology of the human body, Guyton, 1979, Saunders". It is necessary to be taught at least the first 120 pages of it.

# Medical Terminology 2

Credits: 3

Theoretical (51 hours)

Prerequisite: Medical Terminology 1

Curriculum:

The content of course must be harder than Medical Terminology (1). It will be chosen from scientific articles by the medical school.

# The principle of Nutrition

Credits: 2

Theoretical (34 hours)

Prerequisite: Biochemistry

Curriculum:

Part one: The role and importance of nutrition (2 hours)

Introduction, nutritional problems in Iran and the world, importance of nutrition in health, treatment and social health.

Principle of nutrition, goals, history and definition, body chemical compound

Part two: nutrients and their major resources (7 hours)

Carbohydrates, fats, proteins

Energy, definition, assessment of energy and energy balance

Water, elements and vitamins

Part three: food (2 hours)

Food groups

Food tables RDA, WHO and FAO.

Cooked and raw food tables

Part four: recognition and notice to regional culture, belief and nutritional habits about personal and social nutritional assessment, nutritional programs (2 hours)

Social nutritional habits, nutritional programs, the role of proper nutrition plan (the role of government, national and international organization in nutritional programs), academic publications about food and nutrition.

Part five:  Nutrition in vulnerable groups (6 hours)

Nutrient requirements for mothers in pregnancy and lactation, nutrient requirements for neonates and children, nutrient requirements for geriatrics.

Part six:  Nutritional assessment:

Clinical assessment of nutritional status, anthropometric assessment, nutrient assessment, biochemical assessment, socioeconomic assessment.

Part seven: Malnutrition diseases and their prevention (7 hours)

Protein-energy malnutrition (P.E.M), nutritional anemia (iron, folic acid, vitamin B12), endemic goiter, xerophthalmia, Rickets, zinc deficiency, scurvy, beriberi, pellagra, slideshow about malnutrition.

Part eight: Food health :

Principles of food preservation, health food, process, food waste, food poisonings.

# Histology

Credits: 4

Theoretical- Practical

Prerequisite: None

Curriculum:

A- Theoretical (51 hours)

General histology (17 hours)

Introduction to histology, epithelial tissue, connective tissue (cells, filaments, matrix)

Connective tissue (blood, lymph, erythropoiesis, cartilage and its growth, bone, bone formation, fracture remodeling, joint)

Muscular tissue, nervous tissue, peripheral nervous system and end nerves.

Specific histology (34 hours)

1- Circulation system

2- Immune system: lymph node, spleen, thymus, lymphoid tissue, tissue transplantation.

3- Skin and its component

4- Gastrointestinal system: salivary gland, mouth, tooth, tongue, pharynx, esophagus, stomach, intestines, appendix, liver, gall bladder, pancreas, peritoneum

5- Respiratory system: nose, sinuses, larynx, trachea, lung, pleura.

6- Genitourinary system: kidney, urinary ducts, bladder, testes, seminal vesicle, prostate, ovary, uterus, fallopian tube, vagina, vulva

7- Endocrine gland

8- Nervous system

B- practical (34 hours)

Histology educational group should program histological study of different tissues.

# Physiology 1

Credits: 4

Theoretical (68 hours)

Prerequisite: biochemistry, histology, anatomy 1

Curriculum:

1- Cellular physiology and its environment (14 hours)

Hemostasis, fluid compartment, structure and physiology of cell membrane, transport mechanisms (active transport, passive transport, facilitated transport), membrane potential, Membrane Physiology of Nerve and Muscle, Action Potentials and its spreading, Action Potentials in nerve fiber, comparing Action Potential in myocardium, nerve and skeletal and smooth muscles, skeletal muscles contraction, smooth muscles contraction, conduction in synapse(nerve to nerve, nerve to skeletal muscle, nerve to smooth muscle), physiology of cell organelles.

2- Heart muscle physiology (9 hours)

Physiology and anatomy of heart, myocardium characteristic (electrical, conduction, oxygen utilization), heart mechanic (systole and diastole, heart cycle), cardiac output, cardiac sounds, external cardiac nerve, ions and hormones effect on heart, autorhythmicity of heart, electrocardiography, methods of recording electrocardiogram and its relation to ventricle and atrium contraction, electrocardiographic leads, Einthoven triangle, lead axis, mean electrical axis of heart, vector cardiogram, cardiac arrhythmia, premature contractions.

3- Circulation physiology (20 hours)

Physic characteristics of circulation (vascular resistance, viscosity, blood flow In vessels, blood pressure), factors of blood flow(heart pump, vascular resistance, blood volume), arterial circulation(arterial blood pressure, arterial pulse, physiology of arterioles, mean arterial blood pressure, method of measuring of systolic blood pressure, capillary circulation(capillary exchange, osmotic and hydrostatic pressure in capillary, starling law), venous circulation(reservoir and transportation function, venous pump, central venous pulse, measuring of venous pressure), cardiac output regulation and its measurement, nervous regulation of blood pressure(blood pressure reflexes:

chemoreceptor and baroreceptor reflexes), humoral regulation of blood pressure(role of kidney, hormones and ions), blood pressure regulation in specific tissues(heart, brain, viscera, skin, muscles), pulmonary circulation, lymph circulation, effect of muscular activity on cardiovascular system and circulation, circulation shock.

4- Respiratory physiology (12 hours)

Anatomy and physiology of respiratory system, mechanics of breathing(respiratory muscles, intra alveolar pressure, pleural pressure), pulmonary and chest elasticity, compliance of the lung, role of surfactant, work of breathing(work of elasticity, non-elasticity, viscosity), pulmonary volumes and capacity, minute respiratory volume, maximal expiratory pressure, maximum respiratory volume, alveolar ventilation, gas laws and relation to alveolar membrane transportation, intra alveolar gas pressure and its compound, gas exchange between alveoli and blood, ventilation to perfusion ratio, gas transportation in blood(importance of hemoglobin in gas transport), gas exchange in tissues, respiratory center, nervous control of respiration, humoral control of respiration, respiration in specific situation,(mountains, muscular activity, respiration of fetus), no respiratory activity of lungs.

5- Gastrointestinal physiology and metabolism (12 hours)

Gastrointestinal motility, chewing and swallowing, gastric motility, small intestine motility, motility of large intestine and anorectal region, defecation reflex, salivary secretion, chemical digestion In mouth, gastric secretion and its regulation, gastric digestion, exocrine pancreas secretion and its digestive function, bile secretion and its digestive function, intestinal secretion and digestion, absorption in gastrointestinal system, metabolic liver functions, nutritional balance, physiologic effects of vitamins.

# Physiology 2

Credits: 5

Theoretical- Practical

Prerequisite: anatomy 2, physiology 1

Curriculum:

A- theoretical (68 hours)

1- Physiology of endocrine glands and genital system (20 hours)

Introduction to hormone and its mechanism, physiology of adenohypophysis and neurohypophysis, relation between pituitary gland and hypothalamus, physiology of thyroid gland, physiology of parathyroid gland and calcium metabolism, endocrine pancreas and blood glucose regulation, adrenal physiology (cortex and medulla), physiology of thymus and epiphysis, physiology of ovary, female monthly period, pregnancy and placenta, physiology of child delivery, physiology of breast growth and development and lactation, physiology of menopause, physiology of testis and puberty in boys, physiology of prostaglandins.

2- physiology of kidney and body fluid regulation (10 hours)

Anatomy and physiology of kidney, renal circulation, nephron structure, glomerular filtration and its measurement, tubular mechanism for reabsorption and secretion, plasma clearance, renal mechanism for dilute and concentrated urine, autoregulation of renal circulation, compare between urine component and blood component, control of extracellular fluid volume and electrolytes concentration, micturition mechanism.

3- physiology of arterial blood PH regulation

Definition of PH, Henderson-Hasselbalch Equation, acidosis, alkalosis and compensation mechanism, blood buffers effects, extracellular fluid buffers, intracellular buffers, role of respiratory system in PH regulation, role of kidney in PH regulation.

Physiology of blood (6 hours)

Physiology of hematopoietic tissues, physiology of red blood cells, hemoglobin and its role in gas transport, physiology of white blood cells and platelets, coagulation mechanism, physiology of plasma and lymph.

4- physiology of nervous system (28 hours)

Physiology of somatic sensation, physiology of spinal cord, physiology of brain stem, physiology of midbrain, physiology of basal ganglia, physiology of cerebellum, motion control and body position in space (proprioception), physiology of thalamus and hypothalamus, physiology of cortex, learning, memory, reflexes, reticular activating system, limbic system, autonomic nervous system, cerebral waves, body temperature regulation, cerebrospinal fluid, physiology of eye, ear, taste and smell.

B- Practical (34 hours)

# Genetics

Credits: 2

Theoretical (34 hours)

Prerequisite: Biochemistry- Histology

Curriculum:

1- History, practical and clinical importance of medical genetics

2- Definitions and terminology

3- Mendel's rules

4- Hereditary principle of autosomal dominant traits

5- Hereditary principle of autosomal Recessive traits

6- Hereditary principle of sex linked traits

7- Epistasis and its role in inheriting traits

8- Lethal and semi lethal genes, its frequency, types and importance

9- Sex influenced genes and sex limited genes

10- Genes: roles and structures

11- Structural genes and their role in controlling cell life

12- Gene expression and variation

13- Penetration mechanism in genetic disease

14- Mutation mechanism

15- Eukaryotes and prokaryotes genetic differences and similarities

16- Vital life cycle of cells and its relationship with genes and chromosomes

17- Sex chromosomes importance and structure in male and female

18- Chromosomes structure

19- Cell division steps with reduce chromosome and its role in genetic exchanges

20- Spermatogenesis and oogenesis comparison in human

21- Linkage and crossing over mechanism and its role in transmit old and new genetic phenotypes to children

22- Sex ratio and its relation to expression of genetic diseases and disorders

23- Important genetic disorders (Dominant, Recessive, X-linked) in human

24- Gene control mechanism

25- Gene families in human

26- Population genetics, hardy Weinberg law, new mutations, gene frequency and balance, gene pool, genetic causes in similarity between different races and tribes

27- Cytoplasmic hereditary system and its role in genetic material transformation

28- Cytogenetics: human study, chromosomes abnormality (structure or numbers), karyotype preparation, chromosome abnormality mechanism and its causes, important chromosomal abnormalities in human, banding and its importance

29- Gender and role of X and Y chromosomes in sex differentiation, interaction between hormone, chromosomes and genes in creation of genetic, phenotype and behavioral sex

30- Genetic diagnosis of hereditary and non hereditary diseases

31- Identical and non-identical twins and their genetic importance in determination of interaction between environment and genetic factors (discordance and concordance)

32- Immunogenetics: genes and immune system, to inherit blood group and RH, HLA system and immune system related diseases

33- Pedigree

34- Sanguinity, familial marriage and its consequences

35- Molecular Genetic

# Microbiology and virology

Credits: 5

Theoretical- practical

Prerequisite: physiology 2

Curriculum:

A- Theoretical (60 hours)

Principle of Bacteriology (15 hours)

1- Definition and classification of bacteria

2- Eukaryotes and prokaryotes differences

3- Define and divide bacteriology

4- History of bacteriology

5- Shape, size and structure of bacteria

6- Chemical compound and reproduction of bacteria

7- Study methods of bacteria

8- Vital periods of bacteria

9- Bacteria's variations (phenotyping, genotyping)

10- Metabolism of bacteria

11- Physical effects on bacteria

12- Chemical effects on bacteria

13- Antimicrobial effects on bacteria

14- Ecology of bacteria

15- Epidemiology of bacteria

16- Virulence of bacteria

17- Immune system against bacteria

Systematic Bacteriology (30 hours)

1- Micrococcus's: staphylococci

2- Streptococci's: streptococcus, pneumococci

3- Neisseria

4- Gonococcus, meningococcus

5- Bacilli: bacillus, clostridium

6- Lactobacilli

7- Actinomycetes: coryneforms, mycobacterium, Actinomycetes, nocardiosis

8- Enterobacteriaceae: salmonella, shigella, escherichia, proteus, klebsiella, citrobacter, edwardsiella, ewingella

9- Pseudomonads

10- Brucella, yersinia, haemophilus, bordetella, acromobacter,

11- Bacteroides, fusobacterium

12- The vibrios

13- Spirochetes,

14- Borrelia, leptospira

15- Mycoplasmas

16- Rickettsia

17- Chlamydiae

Principle of Virology (15 hours)

1- Definition and history

2- Structure

3- Viruses characteristics

4- Viruses replication

5- Interaction between Viruses and host cell

6- Diagnostic methods of viral diseases

7- Bacteriophages

8- Antiviral drugs

9- Classification of Viruses

Systematic Virology

1- Herpes Viruses

2- Picornaviruses

3- Poxviruses

4- Adenoviruses

5- Orthomyxoviruses

6- Paramyxoviruses

7- Hepatitis viruses

8- Rabies

9- Carcinogenic viruses

B- Practical (51 hours)

1- Microscope and microbiology laboratory instruments

2- Sterilization

3- Preparing microbial media for culture

4- Methods of cultivation and separation of bacteria

5- Preparing smear and staining of bacteria.

6- Microscopic study and cultivation of staphylococcus (coagulase, manitol fermentation, phosphatase test), antibiogram

7- Microscopic study and cultivation of Streptococcus, study of hemolysis (optocin test, inoline fermentation, bacitracin) microscopic study of lactobacillus.

8- Study of Neisseria (Gonococcus and meningococcus, microscopic study and cultivation of infective or non infective neisseria, saccharide fermentation, oxidase test)

9- Enterobacteriaceae sudy(microscopic study and cultivation of deferential, selective and purified media)

10- Microscopic study, cultivation and diagnosis of Brucella, haemophilus and bordetella

11- Study of vibrios(microscopic study, cultivation and biochemical tests, differential diagnosis)

12- Microscopic study, cultivation of Diphtheria, diphtheroids, gram staining, biochemical tests, virulence test of diphtheria, study of listeria.

13- Bacilli: study of anthrax and some clostridium, staining of anthrax spore, biochemical tests, study of anaerobic bacteria.

14- Mycobacterium: study of mycobacterium tuberculosis and leprosy, ziehl neelsen staining, study and culture of actinomycetes.

15- Spirochetes: study of borrelia, treponema, leptospira

16- Study of mycoplasma, rickettsia and chlamydia

17- Different methods of Bacteria counting

18- Some studies of viruses

Points

1- These programs must continuously perform in 2 days.

2- Professors will modify the program according to the facilities.

3- Some extra sessions could be added to this program in order to solve problems and to argue about Practical sessions.

# Immunology

Credits: 3

Theoretical- Practical

Prerequisite: physiology 1

Curriculum:

A- Theoretical (43 hours)

1- Generality of immunology

2- Antigen characteristics (natural, artificial, proteins, haptens, toxins, auto antigens, allergens)

3- competent cells and lymphatic organs (Lymphocyte T and B, plasmocytes, monocytes, macrophages, reticuloendothelial cells)

4- Immunoglobulin: Structure, Types: IgG, IgM, IgA, IgD, IgE,

Immunoglobulin Genetics and production

5- Complement system and its component: Origin and structure, Activation pathways, Hereditary diseases

6- Nonspecific responses (inflammation, phagocytosis)

7- Mechanisms of body immunity: natural, congenital, acquired (active, passive, adaptive and transmitted)

8- Antigen antibody reactions

9- Immediate hypersensitivity (IgE)

10- Cytotoxicity, immune hemolysis, immune cytolysis,

11- Immune complexes

12- Virus susceptibility, biological mediator in cell immunity

13- Immune genetics (HLA)

14- Immunohematology: blood groups, blood transfusion, maternal fetal incompatibility

15- Immune tolerance

16- Autoimmune diseases (mechanism, diagnosis, treatment)

17- Cancer immunology: Humoral and cellular diagnosis, Immune stimulation, Treatment and immunology

18- Immunosuppressants: biologic, immunologic, chemical

19- Immunology of infectious diseases: bacterial, viral, parasitic

20- Immune deficiencies

B- Practical (17 hours)

1- Precipitation in tube and on gel

2- Microbial Agglutination (Wright and Vidal)

3- Blood agglutination

4- Flocculation test

5- Electrophoresis and immune electrophoresis

6- Comb's test

7- Cross match

8- Complement titration

# Parasitology and mycology

Credits: 4

Theoretical- Practical

Prerequisite: Immunology

Curriculum:

A- Theoretical (43 hours)

1- Protozoa (11 hours)

Plasmodium: (vivax, falciparum, malariae), toxoplasma gondii, isospora humanis, blood and tissue sporozoans, leishmania: (Tropica, Donovani, Braziliensis), Trypanosoma, intestinal and genital flagellates: (Giardia lamblia, Triochomonas vaginalis) ciliophora, (Balantidium coli), intestinal Amebas, entamoeba histolytica, pneumocystis

2- The helminths (15 hours)

Trematodes: (fasciola, schistosoma), cestodes: (taenia, echinococcus, hydatid cyst, hymenolepis, diphylobothrium,)

Nematodes: (ascaris, oxyuris, trichocephalus, hook worms, trichostrongylus, strongyloides, trichina worms, filarial worm,

3- Arthropods (8 hours)

Lice (pediculus humanus, phthirus pubis), cimex lectularius, Fleas: (xenopsylla cheopis, pulex irritans, ctenocephalides canis) flies: musca domestica, tabanus sudeticus, myas, anopheles, culex, aedes mosquito, phlebotomus, culicoides, ticks, mites, ornithodoros lahorensis, argas persicus.

4- Fungi (9 hours)

Saprophytes: (mucormycosis, aspergillosis, penicillium, cladosporium, scopulariopsis, streptomysis,)

Superficial fungal diseases (malassezia, corynebacterium minutissimum, aspergillosis, penicillium, mococandida)

Cutaneous fungal diseases: (ectothrix, endothrix, favus, arthrospore, microsporum, trichophyton, epidemophyton)

Subcutaeous fungal diseases: (actinomycotic mycetoma, eumycotic mycetoma)

Mucosal fungal diseases: (candida albicans and other candidas)

Visceral fungal diseases: (Histoplasma capsulatum, Cryptococcus neoformans, aspergillosis, nocardia asteroides)

B- Practical (51 hours)

1- Protozoology:

Methods of laboratory diagnosis of protozoan diseases are thought to medical students such as: blood, stool and tissue tests, sampling and staining methods and microscopic study.

2- Helminthology:

Methods of laboratory diagnosis of nematodes diseases are thought to medical students such as: stool and urine tests, morphology study of worms and their eggs and larvae.

3- Arthropodology:

Biology and morphology of arthropods and how to transmit the diseases and their prevention are thought to medical students.

4- Mycology:

Methods of diagnostic tests for fungal diseases, sampling, direct test, macroscopic culture of saprophytes are thought to medical students.

# General Pathology

Credits: 5

Theoretical- Practical

Prerequisite: Microbiology, Immunology

Curriculum:

A- theoretical (60 hours)

1- Introduction, history, definition, importance of pathology, how to nominate the diseases

2- Cell injury and cell death: hydropic degeneration, fat and hyaline degeneration, protein synthesis inhibition, inhibition of DNA and RNA synthesis, physical, chemical, ischemic, immunologic and biologic cell injury, cell necrosis and its deferent features, pathologic calcification, death and its definite signs.

3- Inflammation and tissue repair: acute, subacute and chronic inflammation, specific and nonspecific inflammation, mechanism of inflammation, critical period of acute inflammation, microscopic and macroscopic signs of inflammation, inflammatory cells and fluid, final result of inflammation, regeneration of injured tissues, wound healing, general body reaction to inflammation.

4- Cell differentiation and disturbance of cell growth: definition of differentiation, atrophy, hypertrophy and obesity, hypoplasia and aplasia, hyperplasia and causes, difference between hyperplasia and neoplasia, metaplasia and its types, dysplasia, anaplasia, neoplasia.

5- Principle about tumors, benign and malignant neoplastic tumors: characteristic of neoplastic cells, classification and nomination of tumors, difference between benign and malignant tumors, carcinogenic factors and causes of cancer, neoplasm in plants and animals, precancerous stages, grading and staging of tumors, prognostic factors in cancers, causes of death in cancer, diagnostic tests in cancer, paraneoplastic syndromes, treatment options in cancer.

6- Hemodynamic disorders, thrombosis, emboli, infarction: hyperemia and congestion, ischemia and anemia, normal and abnormal body fluid distribution, edema, hemorrhage and hemostasis, shock and dehydration, thrombosis and embolism, infarction and gangrene.

7- Acute and chronic bacterial, viral, fungal, parasitic infections: acute infection lesions: staphylococcal, streptococcal, pneumococcal, meningococcal infections, diphtheria, whooping cough, salmonelosis and typhoid fever, bacillary diarrhea, cholera, typhus, anthrax.

   Specific bacterial infection lesions: tuberculosis, syphilis, leprosy, sarcoidosis, lymphogranuloma, rickettsial infections

   Viral lesions: cutaneous, visceral, ocular, nerve lesions.

   Parasitic lesions (protozoa and metazoan)

8- Physical and chemical lesions and age related lesions: mechanical force, thermal injuries, electrical injuries, ionizing radiation lesions, anoxia and hypoxia, poisoning, age related lesions.

9- Tissue pigmentation and metabolic diseases: hemoglobin and its pigmentation, hemochromatosis, jaundice, porphyrines, porphyria, melanosis, tattoo, phenyl ketonuria, gout, diabetes mellitus, fat and glycogen accumulation diseases, nutritional deficiencies.

10- Chromosomal and genetic disorders: normal karyotype, autosomal diseases, sex linked diseases, principle of genetic diseases, relation between chromosomal anomaly and cancers.

11- Immunologic diseases: immunologic reactions, immune system, humoral and cellular antibodies, tissue injuries due to immunologic reactions, immunologic tolerance and autoimmune diseases, classification of immunologic diseases, prevention and treatment of immunologic diseases.

12- Tissue transplantation and how to reject transplant: nomination of transplants, the best choice of transplant, causes of doing transplantation, decline rejection reaction.

13- Principle of pregnancy diseases: placenta previa, ectopic pregnancy, placenta malformations, umbilical and amniotic fluid disorders, neoplasm related pregnancy, dystocia complications.

14- Fetus and neonate diseases: perinatal death, neonatal diseases, premature and post term neonate, hemolytic neonatal disease.

B- practical (51 hours)

guidance to practical and histotechnic points: fat and hyaline degeneration, cellular necrosis, acute and chronic inflammation, granulation tissue, wound cicatrisation, tuberculosis and sarcoidosis granuloma, superficial and deep fungal lesions, cutaneos and visceral viral lesions, protozoan and metazoan lesions, acute and chronic congestion, thrombosis and emboli, infarction and gangrene, atrophy and hypertrophy, hyperplasia and hypoplasia, metaplasia, comparison between benign and malignant cytology, papiloma and carcinoma, adenoma and adenocarcinoma, lipoma and liposarcoma, fibroma and fibrosarcoma, leiomyoma and leiomyosarcoma, angioma and angiosarcoma, osteoma and osteosarcoma, chondroma and chondrosarcoma, mole, choriosarcoma.

# Embryology

Credits: 2

Theoretical (34 hours)

Prerequisite: Histology

Curriculum:

A: General embryology

1- Development of germ cells – gametogenesis

2- First week of Development: fertilization - zygote

3- Second week of development: implantation- germ disc

4- Third week of development: Gastrulation (formation of Mesoblast and Notochord)

5- Forth to eighth week of development: Embryonic period, formation of three germ layer formation.

6- Third month to birth of development: Fetal period, development of fetal membranes and placenta (amnion, umbilical cord, placenta)

7- Congenital malformations

B: Special embryology

1- Development of paraxial mesoderm and notochord, Development of somites (skeletal system, muscles, upper and lower extremities)

2- Development of intermediate mesoderm: development of urinary system (formation of permanent kidney, bladder, urethra, urinary system malformations)

3- Development of genital system: sex differentiation, different stages of sexual development, genital system malformations.

4- Development of circulatory system: Development of heart, arteries, veins, cardiovascular malformations

5- Development of digestive system: formation of digestive tract, Development of pancreas, anorectal malformations

6- Development of face and nose, palate, and teeth

7- Development of ectoblast: Development of primary neural tube, nervous system malformations

8- Development of autonomic nervous system: Development of sympathetic and parasympathetic system

9- Development of sensory organs: formation of sensory placodes, Development of eye, ear, olfactory system

10- Development of endocrine glands

11- Practical tips: karyotyping, sample and smear of cytologic specimen.

# Curriculum of Medical Doctorate Degree

# The second phase: Semiology and Physiopathology

## Physiopathology courses

Credits: 14

Theoretical (238 hours)

Prerequisite: Semiology

Curriculum:

The educational aims are to teach physiologic principle, mechanism and manifestation of diseases and affective factors on them.

Physiopathology courses contain gastrointestinal diseases, cardiovascular diseases, endocrine and metabolism diseases, hematology diseases, respiratory diseases, renal diseases and rheumatology diseases. Their references are the internal medicine textbooks like Harrison internal medicine, Cecil internal medicine and Oxford internal medicine and also physiopathology textbooks.

The curriculum of physiopathology courses are written in the next pages.

# Gastrointestinal Diseases

Theoretical (40 hours)

Curriculum:

1- Esophagus: anatomy and histology, physiology (swallow mechanism, upper and lower esophageal sphincter), physiopathology of esophageal symptoms and signs (dysphagia, esophageal pain, regurgitation, odynophagia), physiopathology, diagnosis and treatment of esophagitis, diffuse esophageal spasm, collagen diseases and scleroderma.

2- Stomach and duodenum: anatomy and histology, physiology (mechanism of gastric emptying, mechanism of gastric secretion), physiopathology, diagnosis and treatment in gastric or duodenal peptic ulcer, cancers, gastritis, drug or stress induced ulcers, Zollinger Ellison syndrome.

3- Small intestine: anatomy and histology, physiology (intestinal motility, absorption mechanism in water, electrolytes, proteins, lipids, carbohydrates, vitamins, iron, calcium and phosphorus) physiopathology, etiology, diagnosis and treatment in malabsorption syndromes and its differential diagnosis, intestinal parasites. Diarrhea and its mechanism, osmotic diarrhea, secretory and combine and hypermotility diarrhea, tumors, tuberculosis, Whipple disease and lymphangiectasia, Crohn disease, bacterial overgrowthsyndrome, obstructive loop, protein losing enteropathy.

4- Large intestine: anatomy and histology, physiology (mechanism of defecation and large intestine motility mechanism, water and salt absorption, rectal sphincters), physiopathology of diarrhea, pain and tenesmus, bloody diarrheas. Large intestine diseases: diagnostic methods, rectorrhagia, tumors and polyps, diverticulitis, ulcerative colitis, crohn's disease, amebiasis, tuberculosis, infectious colitis, irritable bowel syndrome.

5- Liver: anatomy and histology, physiology (the role of liver in metabolism of carbohydrates, proteins lipids, mechanism and processes of biliary secretion), physiopathology, diagnosis and treatment of biliary stones, drug metabolism and pathogenesis of drug complications in liver, physiopathology of jaundice, hepatomegaly and its physiopathology, diagnosis and treatment, abscesses, tumors and hepatic cirrhosis.

6- Pancreas: anatomy and histology, pancreatic exocrine physiology, physiopathology, diagnosis and treatment in acute or chronic pancreatitis, pancreatic fibrocystic changes.

# Cardiovascular diseases

Theoretical (40 hours)

Curriculum:

1- Anatomy, physiology, electrical heart activity, cardiac blood supply, cardiac nerves, regulation of myocardial metabolism (2 hours).

2- Cardiovascular manifestation, physiopathology, cardiac examination (4 hours).

Chest pain, dyspnea, palpitation, edema, syncope, cyanosis, patient general appearance, arteries examination, measurement of blood pressure, veins examination, heart examination, observation and palpation, cardiac auscultation, normal and abnormal sounds, souffle types and their mechanism.

3- Paraclinical in diagnosis of cardiovascular diseases (except electrocardiography) (2 hours).

Radiography, echocardiography, vectorcardiography, exercise test, Holter monitor, nuclear cardiology.

4- Principle of normal cardiac electrophysiology (3 hours)

Electrical waves distribution, arrhythmia and conduction disturbances, blocks, hypertrophies and pacemaker.

5- Rheumatic fever (2 hours)

Etiology, physiopathology, symptoms, signs, differential diagnosis, treatment, prognosis, prevention.

6- Valvular heart diseases (4 hours)

Mitral, aortic, tricuspid, pulmonary valve insufficiency and stenosis, etiology, physiopathology, diagnosis, differential diagnosis, treatment, prognosis, prevention.

7- Congenital heart diseases (3 hours)

Embryology of heart, circulation in fetus, circulation changes after birth, etiology of congenital diseases, physiopathology, diagnosis, differential diagnosis, treatment, prognosis, prevention of common congenital heart diseases ( atrial septal defect, ventricular septal defect, patent ductus arteriosus, tetralogy of Fallot).

8- Hypertension (3 hours)

Etiology, physiopathology, diagnosis, differential diagnosis, emergent cases, treatment, prognosis, prevention.

9- Hypotension, shock, syncope, etiology, physiopathology, diagnosis, differential diagnosis, treatment, prognosis, prevention. (1 hour).

10- Coronary artery diseases (4 hours)

Etiology of atherosclerosis, risk factors, metabolism of myocardium, circulation of coronary arteries and their regulation factor, physiopathology of ischemia, angina, myocardial infarction, diagnosis, differential diagnosis, complications, treatment, prognosis, prevention.

11- Cardiomyopathy (2 hours)

Myocarditis, cardiomyopathies, etiology, physiopathology, diagnosis, differential diagnosis, treatment, prognosis, prevention.

12- Heart failure and its emergencies (3 hours)

Physiopathology, diagnosis, differential diagnosis, treatment, prognosis, prevention.

13- Pericardial diseases (1 hour)

Acute pericarditis, chronic pericarditis, etiology, physiopathology, diagnosis, differential diagnosis, treatment, prognosis, prevention.

14- Infective endocarditis (1 hour)

Etiology, physiopathology, diagnosis, differential diagnosis, treatment, prognosis, prevention.

15- Hypertension in pulmonary vessels and heart and lung (2 hours)

Essential hypertension and secondary hypertension, pulmonary embolism, pulmonary infarction, etiology, physiopathology, diagnosis, differential diagnosis, treatment, prognosis, prevention.

16- Cardiopulmonary resuscitation (1 hour)

17- Arterial diseases (1 hour)

Large arteries: aortitis, Leriche syndrome, Takayasu aortitis, aortic aneurism and dissection. Small arteries: burger, vasculitis, emboli. Etiology, physiopathology, diagnosis, differential diagnosis, treatment, prognosis, prevention.

18- Venous disorders: Great veins, peripheral veins, thrombophlebitis, phlebothrombosis, varicose, etiology, physiopathology, diagnosis, differential diagnosis, treatment, prognosis, prevention.

# Endocrine and Metabolic diseases

Theoretical (32 hours)

Curriculum:

1- principle of Endocrinology

2- Physiology of hypothalamus and anterior pituitary

3- Growth hormone secretion disturbance: mechanism and physiopathology, symptoms and signs, diagnostic tests, treatment of growth hormone excess and deficiency.

4- Physiopathology, diagnosis and treatment of hypopituitarism

5- Mechanism, physiopathology, symptoms and signs, diagnostic tests of prolactinemia, diagnosis and treatment of hypophyseal tumors.

6- Posterior pituitary: physiology and regulation of ADH secretion, mechanism, physiology, symptoms and signs, diagnostic tests, treatment of diabetes insipidus and SIADH.

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

8- Mechanism, physiopathology, symptoms and signs, diagnostic tests of hyperglycemia, diagnosis and treatment of hyperparathyroidism.

9- Mechanism, physiopathology, symptoms and signs, diagnosis and treatment of hypoglycemia, diagnosis and treatment of hypoparathyroidism and osteomalacia.

10- Synthesis, secretion, mechanism and regulation of thyroid hormone and its effects. (1 hour)

11- Thyroid function tests. (1 hour)

12- Classification of thyroid diseases. Physiopathology, diagnosis and treatment of simple and endemic goiter. (1 hour)

13- Hyperthyroidism: etiology, physiopathology, symptoms and signs. Graves disease and physiopathology of non thyroid symptoms and signs in Graves disease. Differentiation between toxic goiter and Basedow disease. Diagnosis and treatment of hyperthyroidism. (2 hours)

14- Etiology, Physiopathology, symptoms and signs, diagnostic tests and treatment of hypothyroidism, cretinism. (1 hour)

15- Mechanism of energy regulation and metabolism, body metabolism after meal, fasting metabolism. (1 hour)

16- Chemical structure, mechanism and regulation of insulin secretion, peripheral effects of insulin, blood glucose homeostasis, anti insulin hormones. (1 hour)

17- Different causes of carbohydrates metabolism disturbance, diabetes mellitus (definition, prevalence, pathogenesis, etiology, classification, physiopathology, symptoms and signs, diagnostic tests) (1 hour)

18- Acute diabetic syndromes: etiology, pathogenesis, physiopathology, symptoms and signs, diagnostic tests and treatment of ketoacidosis and hyperosmolar hyperglycemic coma. (1 hour)

19- Physiopathology of diabetic complications: microangiopathy, macroangiopathy, neuropathy and dermatological complications.

20- Control of diabetes mellitus: regimen, oral drugs and insulin.(1 hour)

21- Hypoglycemia: etiology, classification, physiopathology, symptoms and signs, differential diagnosis, diagnostic tests and treatment. (1 hour)

22- Synthesis, secretion, mechanism, regulation of adrenal hormones secretion and their effects and diagnostic tests. (1 hour)

23- Mechanism, physiopathology, symptoms and signs, diagnosis and treatment of hyperadrenalism. (1 hour)

24- Mechanism, physiopathology, symptoms and signs, diagnosis and treatment of adrenal insufficiency. (1 hour)

25- Metabolism and physiologic effects of catecholamines, pseudo transmitter, relation to neurological and psychological diseases, relation to hypertension and antihypertensive drugs, endocrine hypertension, physiopathology, symptoms and signs, diagnosis and treatment of pheochromocytoma. (1 hour)

26- Physiopathology of male genital glands: embryology, embryonic development and its disorders, physiology of gonadotropin hormones, androgens and their disorders. (1 hour)

27- Mechanism, physiopathology, symptoms and signs, diagnostic tests and treatment of gonadotropin hormones (1 hour)

28- Endocrine causes of amenorrhea. (1 hour)

29- Hirsutism and virilism. (1 hour)

30- Hyperlipidemia. (1 hour)

31- Obesity. (1 hour)

# Hematologic Diseases

Theoretical (32 hours)

Curriculum:

1- Physiology of hematopoietic and lymphatic system: precursor and origin of lymphatic cells, bone marrow structure, how to differentiate and replicate of blood cells in bone marrow, control of hematopoiesis, differentiation and replication disorders of precursor of bone marrow (1 hour)

2- Red blood cell indexes (MCV, MCH, MCHC, MCD), morphologic classification of anemia, utilization of peripheral blood smear and bone marrow smear (1 hour)

3- Physiopathology of anemia: mechanism, body compensating mechanism in anemia, physiopathological classification of anemia, symptoms and signs in anemia (1 hour)

4- Iron metabolism and iron deficiency anemia, chronic disease anemia, symptoms and signs, hematology and treatment in iron deficiency anemia, sideroblastic anemia, hemochromatosis, hemosiderosis (2 hours)

5- Megaloblastic anemia: neucleoproteins, vitamin B12 and folic acid metabolism, etiology, classification, symptoms and signs, hematology and treatment (1 hour)

6- Bone marrow insufficiency and pancytopenia: pure aplasia of any blood cells, causes, symptoms and signs, hematology and treatment (1 hour)

7- Secondary anemia: physiopathology of anemia in chronic infections, chronic renal diseases, chronic hepatic diseases, endocrine diseases, collagen diseases, myelophthisic anemia, cancers, pregnancy (1 hour)

8- Physiopathology of hemolysis, hemolytic anemia, hypersplenism, symptoms and signs, hematology and treatment of hemolytic anemia, hereditary, enzymopathic and autoimmune anemia, hemoglobinuria, hemoglobinopathies ( thalassemia, sickle cell anemia) (5 hours)

9- Physiopathology of white blood cells: physiology of white blood cells, their qualitative and quantitative changes in different diseases. (1 hour)

10- Leukemia (acute and chronic): causes, classification, physiopathology, symptoms and signs, hematology and treatment of acute and chronic leukemia, erythroleukemia and its types. (3 hours)

11- Bone marrow transplantation in aplastic anemia, malignant hematologic diseases (1 hour)

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

13- Lymphoma: classification, physiopathology, symptoms and signs, hematology and treatment of Hudgkin, non Hudgkin lymphoma, Burkit's, fungoid mycosis. (2 hours)

14- Plasma cells and immunoglobulin dyscrasias: classification, physiopathology, symptoms and signs, hematology and treatment of multiple myeloma, macroglobulinemia, heavy chain diseases (1 hour)

15- Homeostasis, physiology of homeostasis (1 hour)

16- Bleeding diseases (vascular and platelet) : classification, physiopathology, symptoms and signs, laboratory tests and treatment of vascular purpura, thrombocytopenic purpura (2 hours)

17- Bleeding diseases (coagulation disorders): classification, physiopathology, symptoms and signs, laboratory tests and treatment of hemophilia, fibrinolysis, DIC, anticoagulant. (2 hours)

18- Immunohematology: blood groups, blood products and their usages, transfusion complications and its treatment, neonatal hemolytic diseases (2 hours)

19- Kinetic of tumors and paraneoplastic syndromes, mechanism of paraneoplastic syndromes, chemotherapy of tumors, urgency in oncology patients. (3 hours)

# Respiratory diseases

Theoretical (32 hours)

Curriculum:

1- Anatomy of respiratory system. (1 hour)

2- Semiology of respiratory system and mechanism of normal and abnormal breathing sounds and diagnostic tests. (3 hours)

3- Ventilation and perfusion, gas exchange, ventilation control. (3 hours)

4- Acid-base homeostasis. (2 hours)

5- Physiopathology, symptom and sign, diagnosis and treatment of asthma and allergic rhinitis. (2 hours)

6- Physiopathology, symptom and sign, diagnosis and treatment of obstructive pulmonary diseases (tracheitis, bronchitis, COPD, emphysema). (2 hours)

7- Physiopathology, symptom and sign, diagnosis and treatment of diffuse lung diseases (hypersensitivity, occupational, granuloma, vasculitis and so on). (2 hours)

8- Physiopathology, symptom and sign, diagnosis and treatment of pulmonary embolism and infarction. (1 hours)

9- Pulmonary defense mechanism and Physiopathology, symptom and sign, diagnosis and treatment of non tuberculosis pulmonary infections (viral, bacterial, fungal and so on). (3 hours)

10- Physiopathology, symptom and sign, diagnosis and treatment of lung abscess and bronchiectasis. (1 hour)

11- Physiopathology, symptom and sign, diagnosis and treatment of tuberculosis. (4 hours)

12- Pleura: physiopathology pleural effusion, empyema, pneumothorax, and neoplasia. (2 hours)

13- Lung tumors (2 hours)

14- Physiopathology, symptom and sign, diagnosis and treatment of ARDS and acute and chronic respiratory failure. (2 hours)

15- Respiratory manifestation of systemic diseases. (1 hour)

16- Other diseases (1 hours)

# Renal diseases

Theoretical (32 hours)

Curriculum:

1- Anatomy and histology and physiology of kidney, renal circulation, glomerular filtration and its regulation, effects of constructive drugs on renal circulation, sodium, potassium, water, hydrogen transport, rennin angiotensin system, renal function in calcium, phosphorus and vitamin D balance. (2 hours)

2- Physiopathology of renal diseases: hematuria, proteinuria, dysuria, polyuria, oliguria and edema. (2 hours)

3- Laboratory diagnostic tests in renal diseases.

4- Etiology, physiopathology, symptom and sign, diagnosis and treatment of acute glomerulonephritis and acute renal failure. (2 hours)

5- Etiology, physiopathology, diagnosis and treatment of chronic renal failure and uremia. (2 hours)

6- Etiology, physiopathology, diagnosis and treatment of urinary tract infections and interstitial nephritis. (2 hours)

7- Etiology, physiopathology, diagnosis and treatment of nephritic syndrome. (2 hours)

8- Essential hypertension and renal hypertension. (2 hours)

9- Kidney and collagen diseases. (2 hours)

10- Kidney and systemic diseases. (2 hours)

11- Kidney and pregnancy and drugs. (2 hours)

12- Water and electrolytes and kidney. (2 hours)

13- Acid-base disorders. (2 hours)

14- Congenital renal diseases and renal tumors. (2 hours)

15- Etiology, physiopathology, diagnosis and treatment of renal stones and obstructive nephropathy. (2 hours)

16- Dialysis and renal transplantation. (2 hours)

# Rheumatic Diseases

Theoretical (32 hours)

Curriculum

Introduction to connective tissue, classification of rheumatic diseases (1 hour)

Physiology, structure and biomechanic of joints and synovial fluid (1 hour)

Immunology and inflammation in articular diseases (4 hours)

Physiopathology, symptoms and signs, diagnosis and treatment of degenerative joint diseases (2 hours)

Physiopathology, symptoms and signs, diagnosis and treatment of inflammatory articular diseases and collagenosis like: rheumatoid fever, rheumatoid arthritis, systemic lupus erythematosus, scleroderma, polymyositis, vasculitis, seronegative spondyloarthropathy (ankilozan spondylitis, reiter's syndrome, psoriatic arthritis, arthritis associated with inflammatory bowel diseases), periodic rheumatism (12 hours)

Physiopathology, symptoms and signs, diagnosis and treatment of metabolic diseases in joints (pseudogout, alkaptonuria, hemochromatosis) (2 hours)

Physiopathology, symptoms and signs, diagnosis and treatment of intra-articular infections, purulent and tuberculosis spondylitis (2 hours)

Physiopathology, symptoms and signs, diagnosis and treatment of non-articular rheumatisms (fibrositis, tendonitis, bursitis, carpal tunnel syndrome) (2 hours)

Diagnostic laboratory methods and synovial fluid analysis (1 hour)

Technics and indication of intra-articular and extra-articular injections (1 hour)

Principle of medication in rheumatic diseases (2 hours)

Principle of rehabilitation in rheumatic diseases (2 hours)

# Specific Pathology

Credits: 6

Theoretical- Practical

Prerequisite: None

Curriculum:

A- theoretical (68 hours)

Hematopoietic system and hematologic diseases

hematopoiesis in fetus and after birth, development of red and white blood cells and platelet, red cell index, classification of anemia, iron deficiency anemia, Vit B12 deficiency anemia, hemolytic and sideroblastic anemia, myelophthisic anemia, primary and secondary polycythemia, white blood cells diseases, leukocytosis and leukopenia, leukemia and myeloproliferative diseases, platelet and its physiologic activity, thrombocytopenia, thrombocytosis and thrombocythemia.

Lymphoreticular system

Physiology and anatomy, hyperplasia, hypoplasia and atrophy of lymphatic tissue, acute and chronic inflammation of lymphatic tissue, histiocytosis, benign and malignant reticuloendotheliosis, antigenic stimulus in lymphoreticular system, lymphoproliferative diseases, immunoproliferative diseases, lymphoma, classification, histology and staging of lymphoma, Hodgkin disease and its staging and grading, spleen and its changes in inflammatory diseases, splenic vascular disorders, primary and secondary splenomegaly, thymus: anatomy and physiology, thymoma and its relation to hematologic, immunologic diseases and myasthenia gravis.

Cardiovascular system

Anatomy and congenital heart diseases, myocardium degeneration, heart pathologic changes in hormonal disturbances, ischemic heart injury and myocardial infarction, hypertensive heart disease, rheumatic fever and rheumatic heart disease, microbial and idiopathic endocarditis, microbial and idiopathic myocarditis, microbial and idiopathic pericarditis, heart tumors, congenital vascular diseases, degenerative artery diseases, atherosclerosis, arteritis diseases, aneurisms: definition, classification and pathogenesis, phlebitis, varicose, phlebosclerosis, lymphangitis, lymphedema, tumors of blood vessels and lymphatic.

Breast pathology

Anatomy and physiology, chronic mastitis, breast changes in hormonal disturbances, benign breast tumors, malignant breast tumors.

Endocrine glands

Pituitary gland: anatomy and physiology, hypophyseal syndrome, hypophyseal tumors and sella turcica tumors, pituitary changes in other endocrine diseases.

Adrenal gland: anatomy and physiology, adrenocortical hyperfunction (hyperadrenalism), adrenal insufficiency, adrenal cortex tumors, adrenal medulla tumors.

Thyroid gland: anatomy and physiology of thyroid gland, simple goiter and colloid, toxic goiter and hyperblastic, hypoplasia, atrophy and degeneration of thyroid gland, acute, chronic and idiopathic thyroiditis, benign and malignant neoplasm of thyroid

Parathyroid gland: anatomy and physiology, calcium and phosphorus metabolism, hyperparathyroidism, parathyroid neoplasm

The Endocrine pancreas: anatomy and physiology, metabolism of carbohydrates, islets of Langerhans and diabetes mellitus, pathologic diabetic changes in other organs, islets of Langerhans tumors

The Exocrine pancreas: anatomy and physiology, pancreatic atrophy and degeneration, pancreatitis, acute necrotizing hemorrhagic pancreatitis, acute purulent pancreatitis, recurrent chronic pancreatitis, fibrocystic pancreatic disease, pancreatic cysts, benign and malignant tumors

Ear pathology:

Acute and chronic external ear inflammation, otitis media, otosclerosis, cholesteatoma, ear neoplasm

Nose, pharynx and larynx: inflammation of nose and sinuses, neoplasm of nose and sinuses, nasopharynx, oropharynx and larynx tumors

Lung, pleura and mediastinum:

Anatomy and physiology, acute dyspnea, atelectasia and pulmonary collapse, hyaline membrane disease and respiratory distress syndrome, congenital alveolar dysplasia, pneumothorax, pulmonary edema, pulmonary infarction and emboli, chronic dyspnea such as pneumoconiosis and emphysema, acute cough diseases such as acute pneumonia, chronic cough diseases such as chronic bronchitis and bronchiectasis, less common diseases such as interstitial pneumonia and hamman-rich syndrome, benign and malignant lung

tumors, correlation between lung cancers and smoking and other factors, pleuritis and hydrothorax, pleural tumors, mediastinal cysts and tumors

Chemoreceptor system pathology: anatomy and physiology, chemoreceptor system tumors

Mouth, teeth and salivary glands pathology:

Anatomy and physiology, congenital malformations, oral inflammatory diseases, oral and salivary gland tumors, mandibular cysts, temperomandibular joint diseases

Digestive system pathology:

Anatomy and physiology, congenital and acquired gastrointestinal malformations, gastrointestinal inflammations and ulcers, vascular and mechanical disorders, benign and malignant gastrointestinal tumors, malabsorption syndrome

Peritoneum and retroperitoneum: anatomy, peritoneal inflammations, mesenteric cysts, primary and secondary peritoneal tumors

Liver and gall bladder:

Anatomy and physiology of liver and bile ducts, congenital diseases, liver necrosis and degeneration, viral and bacterial hepatic infections, drug and chemical hepatic injuries, jaundices, cirrhosis, benign and malignant hepatic tumors, gall bladder inflammatory diseases, gall bladder and bile ducts stones, gall bladder and bile ducts tumors

Skin pathology:

Histology, description of skin lesions, cutaneous pigmentation disorders, primary and secondary skin tumors

The female genital tract pathology:

Embryology and congenital anomalies, histology and physiology, inflammatory diseases of vulva, vagina, uterus, fallopian tube and ovary, benign and malignant tumors of vulva, vagina, uterus and ovary, bisexuals and gonadal disorders, placental diseases

Kidney pathology:

Anatomy and physiology, congenital anomalies, glomerular diseases (glomerulonephritis), renal tubular diseases, renal vessels diseases, pyelonephritis, interstitial nephritis, renal tuberculosis, renal stones, hydronephrosis, renal cysts and neoplasm

Ureter, bladder and urethra: anatomy and physiology, congenital anomalies, inflammation of bladder and urinary tracts, ureter, bladder and urethra tumors

The male genital tract pathology:

Anatomy, prostate inflammations and tumors, penile inflammations and tumors, testicular inflammations and tumors, scrotum and seminal vesicle diseases

Bone pathology:

Bone structure, congenital anomalies and hereditary bone diseases, bone fracture and remodeling lesions, metabolic bone lesions, bone infections, bone cysts and paget disease, benign and malignant bone tumors

Joint pathology: anatomy and physiology of joints, infectious arthritis, rheumatoid arthritis, metabolic arthropathy and arthrosis, trauma induced joint lesions, joint tumors

Skeletal muscle pathology: anatomy and physiology, muscular atrophy, muscular dystrophies, myosites, ischemic and metabolic muscular diseases, benign and malignant skeletal muscle tumors

Nervous system pathology:

Anatomy and physiology, congenital nervous system diseases, degenerative nervous system diseases, brain and spinal cord vascular disorders, traumatic nervous system diseases, infectious nervous system diseases, nervous system tumors, peripheral nervous system diseases

Eye pathology:

Embryology, anatomy, histology and physiology of eye, congenital ophthalmic anomalies, inflammation of globe, eyelids, conjunctiva and lacrimal system, sympathetic ophthalmia, glaucoma, cataract, retrolental fibroplasia, papilledema, retinopathies, eyelids and conjunctival tumors, eye tumors

B- Practical (68 hours)

# Pharmacology

Credits: 4

Theoretical- Practical

Prerequisite: None

Curriculum:

A- Theoretical (60 hours)

Principle of pharmacology, drugs and receptors, pharmacokinetic, metabolism of drugs and enzyme induction, clinical value and performance drug, pharmacogenetic, principle of neuropharmacology, cholinergic drugs, anti-cholinergic drugs, neuromuscular drugs and muscular relaxant, adrenergic and anti-adrenergic drugs, antihypertensive drugs, histamine and antihistamine drugs, serotonin and anti-serotonin drugs, kinins, prostaglandin, psychopharmacology drugs: antipsychotic drugs and antianxiety drugs, antidepressant drugs, sedative drugs and alcohol, antiepileptic drugs, opioid drugs, addiction and its treatment, non opioid analgesic drugs, anti inflammatory drugs, pharmacology of general anesthetic drugs, local anesthetic drugs, cardiac glycoside, anti arrhythmic drugs, anti anginal drugs, anti atherosclerotic drugs, anti coagulation drugs, diuretic, respiratory drugs, gastrointestinal drugs, insulin, glucagon, oral anti diabetic drugs, adrenal steroids, thyroid hormones, anti thyroid drugs, calcitonin, parathyroid hormone, vitamin D, posterior pituitary hormones, stimulating drugs, tocolytic drugs, anterior pituitary gonadotropins, sexual hormones, contraceptive drugs, teratogenic drugs, anti anemia drugs, vitamins, principle of chemotherapy, sulfonamides, antibiotics, anti tuberculosis and anti leprosy drugs, local antiseptic drugs, anti parasitic drugs: anti amebiasis, antimalarial drugs, cutaneous antiparasitic drugs, anthelmintic drugs, antifungal drugs, cancer drugs, immunopharmacology: toxin and antitoxin, drug interaction, prescription.

B- Practical (17 hours)

Pharmacology educational group regulates practical.

# Semiology

Credits: 4

Theoretical- Training

Prerequisite: None

Curriculum:

A- Theoretical (25 hours)

Introduction, history of medicine and development of diagnostic procedure, ethics, start of interview such as: name, gender, age, birth place, residence place, marriage status, patients complaints, description of current diseases, quality and quantity of complaints, previous diagnostic procedures and treatment.

History:

1- General medical diseases, history of hospital admit,

2- Drug history, drug allergy, other allergies, transfusion history,

3- Operation and accidents,

4- Personal and social history: marriage, number of children, their ages, health condition, addiction (alcohol, smoking, opioid and so on)

5- Familial history: father age and his health status, mother, sisters, brothers, if they died, the reason and age of death, their hereditary diseases and their important diseases,

6- examination: skin, head, eye, ear, nose, pharynx, respiratory system, cardiovascular system, gastrointestinal system, glands, genitourinary system, bone and muscles and joints, nervous system, psychology, (3 hours)

To prepare patient for examination, physical examination

Patient condition (level of consciousness, cooperation and position of patient, weight, length, nutrition and so on)

Vital signs: blood pressure, pulse, respiratory rate, temperature, (1 hour)

Dermatological examination (1 hour)

Examination of lymph nodes and hematologic system (1 hour)

Examination of head, neck, ear, nose and pharynx (2 hours)

Eye examination (1 hour)

Examination of chest and breasts (1 hour)

Lungs examination (2 hours)

Cardiovascular examination (2 hours)

Abdominal examination (2 hours)

Genitourinary examination (1 hour)

Examination of extremities and spinal column (1 hour)

Endocrine examination (1 hour)

Nervous system and psychological examination (2 hours)

How to write the patient profile, summary of history, clinical and paraclinical evidence, problem list, solutions, differential diagnosis, daily note (1 hour)

B- Training of semiology:

The medical school regulates the training sessions in clinical wards twice a week. It is better that the medical students do physical examination and take history. It must be taught to medical student how to do examination with stethoscope, sphygmomanometer, ophthalmoscope, otoscope, reflex hammer.

# Health Training

Credits: 2

Training

Prerequisite: Basic Sciences

Curriculum:

The medical student should pass health training in health and treatment centers at the end of second or third year of medical education for 3 weeks.

# The Third Phase:

## A- Clinical Training

## B-Theoretical courses

# Internal Medicine training

Training Duration: 6 months

Credits: 18

Curriculum:

Internal Medicine training contains internal medicine, dermatology, neurology and infectious diseases.

Educational activities in Internal Medicine:

7.5-8 am: The medical students visit the patients.

8-9 am morning report: to introduce, to explain and to argue about in-patient cases who were admitted during the day before.

9-12 am educational visit: The professors, residents, interns and medical students visit the patients.

12-13 pm: rest, lunch

13-14 pm hospital educational conferences (CPC, morbidity and mortality conference, grand round and so on)

## Surgery training

Training Duration: 4 months

Credits: 12

Curriculum:

Surgery training contains general surgery, urology, orthopedic training.

Educational surgery group regulates surgery training program.

# Pediatrics training

Training Duration: 3 months

Credits: 9

Curriculum:

Educational activities in Pediatric training:

7.5-8 am: The medical students visit the patients.

8-9 am morning report: to introduce, to explain and to argue about in-patient cases who were admitted during the day before.

9-12 am educational visit: The professors, residents, interns and medical students visit the patients.

12-13 pm: rest, lunch

13-14 pm hospital educational conferences (CPC, morbidity and mortality conference, grand round and so on)

# Obstetrics and Gynecology training

Training Duration: 2 months

Credits: 6

Curriculum:

Educational Obstetrics and Gynecology group regulates Obstetrics and Gynecology training program.

# Ophthalmology training

Training Duration: 1 month

Credits: 3

Curriculum:

Minimum curriculum should be taught:

1- Ocular anatomy and physiology: ocular globe, eyelids, lacrimal ducts, ocular muscles and nerves, orbit.

2- General ocular examination: anterior and posterior ocular parts, ocular movement, binocular coordination.

3- Ophthalmic drugs and other drugs effects on the eye.

4- Ophthalmic diseases: conjunctiva and lacrimal sac, corneal diseases, ophthalmic nerve, lens and refractive error.

5- Strabismus, diagnosis and treatment.

6- Glaucoma in children and adults.

7- Ophthalmologic emergencies: alkaline and acid, trauma, ocular laceration, thrombosis in ophthalmic veins, radiologic diagnostic procedure in eye, orbital fracture, foreign body.

8- Manifestation of general disease in eye: diabetes, hypertension, infectious diseases.

9- Headache and eye.

# Ear, Nose and Throat training

Training Duration: 1 month

Credits: 3

Curriculum:

Minimum curriculum should be taught:

1- Ear anatomy and physiology, audiometry.

2- Ear diseases: external ear, tympanic membrane, otitis media, internal ear, deafness and its differential diagnosis, tinnitus, deafness rehabilitation, differential diagnosis of vertigo, $7^{th}$ and $8^{th}$ nerves diseases and auditory canal in skull.

3- Head and Neck: maxillofacial surgery, facial bones fractures, deep neck infections, differential diagnosis of neck tumors, salivary gland diseases.

4- Nose: nasal anatomy and physiology, sinus anatomy and physiology, nasal diseases.

5- Anatomy, physiology and diseases of mouth, teeth, tonsils and adenoids.

6- Larynx: laryngeal anatomy, physiology and diseases.

7- Bronchoesophagology: esophageal and tracheal anatomy, physiology and diseases, tracheotomy and care of the patient, different procedures of opening breath tract.

# Psychology training

Training Duration: 1 month

Credits: 3

Curriculum:

General activity in psychology training contains individually in-patient assessment by medical students, interns and residents under supervision of psychologist then argument about patient in team group. Medical student should attend in familial group therapy, ECT, theoretical classes, treatment of out-patient, psychotherapy, clinical psychiatry, psychiatric tests, emergency and consultation. The medical student should be taught to notice to normal and abnormal reaction to mental illnesses and mental patients and to get feedback.

Theoretical: Medical students who are studying psychology training should have theoretical psychology sessions at least 20 hours such as:

1- How to do interview and history taking of mental patient.

2- How to do interview and history taking of patient's family, how to collect information and how to plan the treatment.

3- Psychological emergency

4- Psychiatric therapy: supportive, (short term and long term).

5- Family therapy and group therapy.

6- Clinical usages of psychiatric tests.

7- Consultation in psychology.

# Radiology training

Training Duration: 1 month

Credits: 3

Curriculum:

Minimum curriculum should be taught:

1- Principle of physic X-ray and its usages in medicine (radiology and radiotherapy).

2- Radiology anatomy: plain X-rays in different aspects (anteroposterior, Lateral, oblique and …), plain X-rays in different anatomical parts of body (head and neck, vertebral column, pelvis, chest, abdomen, extremities, bones, joints, gastrointestinal tract, urinary tract, cardiovascular system and …)

3- Diagnostic radiologic imaging: plain radiography, radiography with oral and injectable contrast media such as gastrointestinal assay, angiography, urography, myelography and so on.

4- Nuclear medicine and its usages in diagnostic medical procedure.

5- Up-to-date diagnostic imaging:

a) Ultrasonography

b) CT-scan

c) Nuclear magnetic resonance (NMR)

d) Positron emission tomography (PET)

e) Digital subtraction angiography (DSR).

# Dermatology training

Training Duration: 1 month

Credits: 3

Curriculum:

Minimum curriculum should be taught:

1- The basic elements of skin.

2- Parasitic skin infections.

3- Microbial skin infections.

4- Viral skin infections.

5- Leprosy, Tuberculosis, cutaneous tuberculosis, Sarcoidosis.

6- Superficial fungal skin infections.

7- Deep fungal skin infections.

8- Diseases due to solar irritation.

9- Bullous diseases of the skin.

10- Allergic and occupational allergic diseases, occupational dermatitis, skin cancers, lymphomas.

11- Skin diseases due to metabolic disorders.

12- Psychosomatic disorders (Lichen planus, psoriasis, neurodermatitis, vitiligo and so on).

13- Sexually transmitted diseases: soft chancroid, benign lymphogranulomatosis, urethritis, syphilis.

14- Immunology, erythroderma, precancerous lesions, paraneoplastic lesions and toxidermia.

# Medical statistics and research methodology

Credits: 2

Theoretical (34 hours)

Curriculum:

Aims

1- Student should be familiar with common methods of research in medical sciences

2- Ability of student for data collection and statistically presentation of data

3- Student should be familiar with Statistical Inference in order to understand completely of medical articles.

4- Ability of student to do simple medical and health researches

Content:

1- Research concept and its types (2 hours)

2- Research steps (2 hours)

3- Data types and methods of data collection (1 hour)

4- Classification of data and presentation by tables and graphs (3 hours)

5- Numerical data description(measures of dispersion and central tendency) (3 hours)

6- Probability concept and its simple rules (2 hours)

7- Binomial distribution and its utilization in medical sciences (2 hours)

8- Time distribution and its utilization in medical sciences (2 hours)

9- Sampling and its techniques (2 hours)

10- Central limit theorem, estimation of confidence limits, variance and mean, estimation of sample size (4 hours)

11- Hypothesis concept, statistical test, type one and type two errors (1 hour)

12- Some important statistical tests in medical articles (the mean difference test, difference test between two means, difference test between two proportions) (4 hours)

13- concept of dependence between two variables and method of measurement in qualitative and quantitative variables (correlation coefficient, chi square) (4 hours)

14- Statistical survey of some selected medical articles (2 hours)

# Infectious diseases

Credits: 3

Theoretical (51 hours)

Curriculum:

1- Microbial virulence, pathogenesis of infections. (1 hour)

2- Fever: control of Body temperature, pathogenesis of fever, diseases with high body temperature, diseases with low body temperature, causes of fever, clinical importance of fever, fever types, epidemiology of fever, transient febrile diseases, diseases with long-term fever, (FUO). (2 hours)

3- Immunity mechanisms: skin, mucosa and body secretions, polynuclear and mononuclear cells, lymphocytes, macrophages, immunoglobulins, complement system, body response to immune reactions, interferon. (2 hours)

4- Serologic and skin tests: definition, antigens and antibodies against viruses, bacteria, fungi, mycoplasma, rickettsia, parasites. (1 hour)

5- Principle of antibiotic therapy: microorganism determination, determination of antibiotic sensitivity, immunity factors, combination therapy with two or more antibiotics (synergism and antagonism), how to use antibiotics. (3 hours)

6- Septic shock: cell injuries of shock, hemodynamic changes, etiology, physiopathology, signs and symptoms. (1 hour)

7- Epidemiology of infectious diseases. (2 hours)

8- Gram positive cocci infections. (streptococci, staphylococci) (2 hours)

9- Gram negative cocci infections. (Meningococcal meningitis, Gonococcal urethritis). (2 hours)

10- Gram positive bacilli infections (Listeria, anthrax) (2 hours)

11- Gram negative bacilli infections (vibrio cholera, enterobacteria, pseudomonas, salmonella, hemophilus, shigella, brucella, legionella) (5 hours)

12- spirochetal infections (syphilis, leptospirosis) (2 hours)

13- Anaerobic infections (tetanus, botulism, bacteroides) (2 hours)

14- Mycobacterium: tuberculosis (bacteriology, diagnosis and culture, primary infection, tuberculous adenitis, vaccination, tuberculin test, prevention and treatment). (4 hours)

15- Leprosy (1 hour)

16- Fungal infections (3 hours)

17- Protozeal infections (amebiasis, malaria, toxoplasmosis, leishmaniosis, pneumocystis carini, giardiasis, trichomoniasis, isospora) (5 hours)

18- Viral infections (influenza, herpes, rabies, picornaviruses like: poliomyelitis, coxsackievirus and enteroviruses, pox, adenovirus hepatitis viruses) (5 hours)

19- Mycoplasma infections (pneumonia, urethritis) (1 hour)

20- chlamydial infections (trachomatis, psittacosis, urethritis) (1 hour)

21- rickettsial infections (typhus, rocky mountain) (1 hour)

22- Helminth infections (ascaris, pinworm, ancylostoma, strongyloides, hydatid cyst, taenia, trichinosis, hymenolepsis nana and other common worms) (3 hours)

Diphtheria and rash infections are taught in pediatrics courses.

# Neurology diseases

Credits: 2

Theoretical (34 hours)

Curriculum:

1- Neurological examination (history of neurological disease, cortex activity, memory, language, aphasias, dysarthria, apraxia, pyramidal and extra pyramidal pathway, physiopathology, cerebellar disorders, reflexes, sensory and motor examination) (3 hours)

2- Physiopathology, diagnosis and treatment of headaches. (1 hour)

3- Physiopathology of brain circulation, cerebral vascular disorders. (3 hours)

4- Etiology, mechanism, Physiopathology, diagnosis and treatment of Epilepsy. (3 hours)

5- Dementia (1 hour)

6- Physiopathology, diagnosis and treatment of myopathies, motor neuron diseases. (2 hours)

7- Physiopathology of peripheral nerves, diagnosis and treatment of neuropathies. (3 hours)

8- Physiopathology of spinal cord, differential diagnosis and treatment of spinal cord injuries. (2 hours)

9- Physiopathology, diagnosis and treatment of multiple sclerosis. (1 hour)

10- Physiopathology, diagnosis and treatment of extra pyramidal diseases and their motor disorders. (3 hours)

11- Space-occupying lesions of the brain (tumor, abscess, subdural hematoma, epidural hematoma) (2 hours)

12- Increase intracranial pressure (1 hour)

13- Etiology, Physiopathology, mechanism of coma, localization of injury, diagnosis and treatment of coma. (2 hours)

14- Vertigo (1 hour)

15- Evaluation of visual pathway, Physiopathology, diagnosis and treatment of its diseases. (1 hour)

16- Neurological complications of infectious diseases. (2 hours)

17- Neurological complications of internal diseases. (2 hours)

18- Skin diseases and neurological diseases. (1 hour)

19- Paraclinical evaluation of neurological diseases. (1 hour)

## Surgery diseases

Credits: 10

Theoretical (170 hours)

Prerequisite: None

Curriculum:

1- Water and electrolytes in operated patient and normal fluid composition, how much patients need water and electrolytes and what factors change their needs. (2 hours)

2- Abnormal body fluid loss, fluid shift, body fluid and electrolytes gain and loss. (1 hour)

3- Acid-base balance, metabolic and respiratory acidosis and alkalosis. (1 hour)

4- Nutrition in the surgical patients and parenteral nutrition. (2 hours)

5- Hemostasis and surgical bleeding, surgical patient evaluation of bleeding, coagulation (1 hour)

6- Transfusion (1 hour)

7- Hemorrhagic shock (2 hours)

8- Gram negative shock (1 hour)

9- Surgical infections (2 hours)

<u>Chest diseases (9 hours)</u>

1- chest surgery (1 hour)

2- chest trauma and its gunshot wounds (2 hours)

3- Lung hydatid cyst (1 hour)

4- Diaphragm diseases (1 hour)

5- Mediastinal tumors (1 hour)

6- Lung cancers (1 hour)

7- Heart Surgery (1 hour)

8- Great vessels surgery (1 hour)

Gastrointestinal surgery (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- Hepatic diseases (3 hours)

6- Intestine obstruction (2 hours)

7- Small intestine surgical diseases (1 hour)

8- Large intestine surgical diseases (2 hours)

9- Rectum and anus surgical diseases (2 hours)

10- Large intestine tumors (2 hours)

11- Appendicitis (2 hours)

12- Peritoneum and peritoneal cavity (tuberculous peritonitis) acute peritonitis, visceral perforation, tumors, hernias. (3 hours)

13- Spleen diseases (1 hour)

14- Portal hypertension (2 hours)

15- Gastrointestinal bleeding (2 hours)

16- Abdominal trauma, intra abdominal bleeding, non penetrating trauma, penetrating trauma and abdominal gunshot wounds. (4 hours)

Endocrine glands (5 hours)

1- Thyroid and parathyroid surgical diseases. (4 hours)

2- Adrenal surgical diseases (1 hour)

Other surgeries (15 hours)

1- Face and mandible malformations (2 hours)

2- Head and neck tumors ( salivary gland, oral cavity) (2 hours)

3- Benign and malignant breast tumors (4 hours)

4- Larynx and pharynx surgical diseases (3 hours)

5- Skin and soft tissue tumors (3 hours)

6- Head and neck trauma (1 hour)

7- Burns (2 hours)

Neurological system surgery (12 hours)

1- Head trauma and its hemorrhage (2 hours)

2- Spinal cord trauma and its hemorrhage (1 hour)

3- Intra cerebral vascular diseases (1 hour)

4- Congenital brain and spinal cord diseases. (2 hours)

5- Brain tumors (2 hours)

6- Disc hernia (1 hour)

7- Spinal cord tumors (1 hour)

8- Neuroradiology (1 hour)

Genitourinary system diseases (14 hours)

1- Patient examination and urinary tract evaluation (1 hour)

2- Urinary system tumors (4 hours)

3- Urinary stones (1 hour)

4- Urinary system stenosis, stricture and complications (1 hour)

5- Urinary tract infections (2 hours)

6- Genitourinary system malformation (1 hour)

7- Urethritis (1 hour)

8- Scrotal diseases (1 hour)

9- Urologic emergency (1 hour)

10- Urinary system trauma (1 hour)

Pediatrics surgery (9 hours)

1- vomiting in the first months of life (1 hour)

2- Abdominal pain in children (1 hour)

3- Intestinal obstruction, duodenal malformations (1 hour)

4- Hirschsprung's disease (1 hour)

5- Wilms tumor (1 hour)

6- Neuroblastoma (1 hour)

7- Pediatric surgical emergency (1 hour)

8- Common surgery in children (1 hour)

9- Surgical time in pediatrics surgery (1 hour)

Vascular surgery (14 hours)

1- Aortoiliac occlusive disease (1 hour)

2- Femoropopliteal occlusive disease (1 hour)

3- Visceral arterial occlusive disease (1 hour)

4- Extracranial cerebral vessels diseases (1 hour)

5- Aortic, peripheral and visceral artery aneurysms (2 hours)

6- Burger disease (1 hour)

7- Angiospastic diseases (1 hour)

8- Arterial embolism (1 hour)

9- Vascular trauma, gunshot trauma (1 hour)

10- Venous and lymphatic diseases, varicose, chronic venous insufficiency, acute thrombophlebitis, pulmonary embolism, superior vena cava obstruction. (2 hours)

11- Thoracic outlet syndrome (1 hour)

Anesthesia (11 hours)

1- Preoperative evaluation of patient (general examination, cardiovascular risk assessment, risk assessment in diabetic patients and pregnancy, anesthesia drugs, drug reactions, empty stomach) (2 hours)

2- Determination of surgical risk with respiratory tests before operation, respiratory complications, chronic respiratory failure, smoking, history of sputum production, clinical tests (2 hours)

3- A) Surgical anesthesia, drug effect mechanism, anesthesia processes B) activity in respiratory care unit, neurosurgical patients. (2 hours)

4- Poisonings, adult respiratory distress syndrome, aspiration, post operation respiratory complications, pain clinic, physiopathology and research of pain in the pain centers. (1 hour)

5- Cardiopulmonary resuscitation: primary and advanced (2 hours)

Orthopedic (29 hours)

1- Bones and joints examination and orthopedic patient evaluation. (2 hours)

2- Definition, classification, clinical symptoms and signs of fracture, definition of dislocation, fracture evaluation in emergency ward (1 hour)

3- Bone, tendon, ligament healing and repair mechanism, nonunion and delayed union, bone transplantation. (1 hour)

4- Open fracture, causes, primary treatment, wound care for open fracture. (1 hour)

5- Fracture complications, fat emboli, gas gangrene, tetanus, osteomyelitis, Volkmann ischemic syndrome. (1 hour)

6- Wrist fracture and dislocation, forearm bones fracture. (1 hour)

7- Arm and shoulder fracture and shoulder dislocation. (1 hour)

8- Spinal fracture and dislocation (1 hour)

9- Pelvic fracture (1 hour)

10- Hip and femur fracture and dislocation (1 hour)

11- Knee fracture and dislocation and its ligament injuries (1 hour)

12- Leg, ankle, foot fracture and dislocation (1 hour)

13- Amputation (1 hour)

14- Etiology and mechanism of bone and joint infections, acute and chronic osteomyelitis, purulent arthritis. (1 hour)

15- Bone and joint tuberculosis and syphilis, fungal bone infections (1 hour)

16- Congenital hip dislocation (1 hour)

17- Clubfoot, varus metatarsus (1 hour)

18- Other congenital bone and joint malformation, sprigle, syndactyly, polydactyly, macrodactyly (1 hour)

19- Bone and non bone tumors (1 hour)

20- Progressive myositis ossificans, muscle tumors (1 hour)

21- Anterior and posterior compartment syndrome of leg, carpal tunnel syndrome (1 hour)

22- Poliomyelitis, cerebral palsy. (1 hour)

23- Orthopedic in other bone and joint disorders (2 hours)

24- Aseptic necrosis in child femoral head, adult hip osteoarthritis (aseptic necrosis in femoral head and sublaxation femoral epiphysis in children) (2hours)

25- Shoulder girdle injuries, frozen shoulder, tennis elbow. (1 hour)

26- Osteochondritis dissecans, congenital patellar dislocation, knee osteoarthritis (1 hour)

# Psychological diseases

Credits: 2

Theoretical (34 hours)

Curriculum:

1- Definition, the field of psychology (1 hour)

2- Neurochemistry and neurophysiology of behavior. (1 hour)

3- Stress and emotions (1 hour)

4- Different theories about of mind structure and human mental growth. (2 hours)

5- Defensive mechanisms (1 hour)

6- Principle of psychological interview and evaluation (1 hour)

7- Semiology of psychological diseases (1 hour)

8- History taking and mental status examination (1 hour)

9- Classification of psychological diseases. (1 hour)

10- Principle of psychopharmacology and treatment in psychology (1 hour)

11- Psychotic disorders (2 hours)

12- Mood disorders (2 hours)

13- Anxiety disorders (neurosis) (2 hours)

14- Stress and accidents related disorders. (1 hour)

15- Conversion disorders (1 hour)

16- Dissociative disorders (1 hour)

17- Somatization disorders and hypochondriasis (1 hour)

18- Personality disorders (2 hours)

19- psychotic organic brain syndrome (1 hour)

20- Psychosomatic disorders (1 hour)

21- Brain and sexual drives, physiologic sexual responses (1 hour)

22- Sexual dysfunctions and disorders (2 hours)

23- Drug and substance dependence (1 hour)

24- Child psychological examination (1 hour)

25- Principle of pediatric psychology (2 hours)

26- Different psychiatric treatment in psychology (2 hours)

# Forensic medicine and poisoning

Credits: 2

Theoretical (34 hours)

Prerequisite: None

Curriculum:

1- Forensic medicine and occupational medicine (1 hour)

2- Principle of ethics, rules and laws about medical practice (3 hours)

3- Thanatology (death science) (3 hours)

4- Identification, identification of humane remains. (3 hours)

5- Asphexias (2 hours)

6- Sexual problems (3 hours)

7- Traumatology :

Trauma and injuries (2 hours)

Accidents and crashes (2 hours)

Heat and cold (2 hours)

Irradiation and electricity (1 hour)

Sound and noise (1 hour)

8- Poisonings:

Cyanide, Arsenic, Mercury poisoning (1 hour)

Opium poisoning (2 hours)

Poisoning by poisonous animal (2 hours)

Petroleum product poisoning (1 hour)

Carbon Monoxide poisoning (1 hour)

Insecticide poisoning (1 hour)

Lead poisoning (1 hour)

Benzene poisoning (solvents) (1 hour)

Dust hazards (pneumoconiosis) (1 hour)

# Medical History and Ethics

Credits: 2

Theoretical

Prerequisite: None

Curriculum:

General history of medicine (2 hours)

Iranian medical history (before Islam and Islamic period) (6 hours)

Introduce the medical textbooks in Islamic period: The Canon in medicine, Alhavi, Aroozi's four articles, Zakhireye Khwarazmshahi (2 hours)

Definition and description of ethics (1 hour)

Ethics and ethical principle in medicine and medical sciences (4 hours)

Interaction between physician and patient and his/her family (medical professional secrecy) (6 hours)

Ethical principle in different medical specialties (general medicine, obstetrics & gynecology, psychology, surgery, internal medicine, pediatrics and so on) (2 hours)

Specific medical situation (transplantation, genetic problems, sperm bank, birth intervals, abortion, sterilization, artificial insemination) (8 hours)

Generalities about death (medical and philosophical aspects) (2 hours)

Affidavits (1 hour)

Dr. Fereidon Azizi

The head of medical group of the Planning Council

Curriculum of **epidemiology of common diseases in Iran** (public health 5) contains:

1- Epidemiology and control of malaria
2- Epidemiology and control of leishmaniasis
3- Epidemiology and control of tuberculosis
4- Epidemiology and control of leprosy
5- Epidemiology and control of typhoid and other enteric fever
6- Epidemiology and control of typhoid and other enteric fever
7- Epidemiology and control of viral hepatitis
8- Epidemiology and control of food- borne diseases (ascaris, hook worms, trichocephalus)
9- Epidemiology and control of amebiasis and giardiasis
10- Epidemiology and control of diarrheal diseases
11- Epidemiology and control of brucellosis
12- Epidemiology and control of cholera
13- Epidemiology and control of rabies
14- Epidemiology and control of cancers
15- Epidemiology and control of diabetes
16- Epidemiology and control of hypertension
17- Epidemiology and control of ischemic heart diseases
18- Epidemiology and control of rheumatism diseases and rheumatoid fever

# The principle of Nutrition

Credits: 2

Theoretical (34 hours)

Prerequisite: Biochemistry

Curriculum:

Part one: The role and importance of nutrition (2 hours)

Introduction, nutritional problems in Iran and the world, importance of nutrition in health, treatment and social health, the journals about nutrition and food.

Principle of nutrition, goals, history and definition, body chemical compound

Part two: nutrients and their major resources (7 hours)

Carbohydrates, fats, proteins

Energy, definition, assessment of energy and energy balance

Water, elements and vitamins

Part three: food (2 hours)

Food groups (2 hours)

Food tables RDA, WHO and FAO.

Cooked and raw food tables

Part four: recognition and notice to regional culture, belief and nutritional habits about personal and social nutritional assessment, nutritional programs (2 hours)

Social nutritional habits, nutritional programs, the role of proper nutrition plan (the role of government, national and international organization in nutritional programs)

The role of breastfeeding in neonatal and infantile nutritional requirements (1 hour)

Part five:  Nutrition in vulnerable groups (6 hours)

Nutrient requirements for mothers in pregnancy and lactation, nutrient requirements for neonates and children, nutrient requirements for geriatrics.

Part six:  Nutritional assessment: (4 hours)

Clinical assessment of nutritional status, anthropometric assessment, nutrient assessment, biochemical assessment, socioeconomic assessment.

Part seven: Malnutrition diseases and their prevention (7 hours)

Protein-energy malnutrition (P.E.M), nutritional anemia (iron, folic acid, vitamin B12), endemic goiter, xerophthalmia, Rickets, zinc deficiency, scurvy, beriberi, pellagra, slideshow about malnutrition.

Part eight: Food health (2 hours)

Principles of food preservation, health food, process, food waste, food poisonings.

# Pediatrics diseases

Credits: 6

Theoretical (102 hours)

Prerequisite: None

Curriculum:

1- Normal neonate (2 hours)

2- Premature neonate and SSGA and LGA (1 hour)

3- Care of the normal neonate (1 hour)

4- Care of the premature neonate (1 hour)

5- Neonatal asphyxia and respiratory problems, complication of O2 therapy (2 hours)

6- Neonatal and child resuscitation (1 hour)

7- Physiopathology, etiology and treatment of icterus (3 hours)

8- Growth and development and its disorders (embryonic stage to puberty) (3 hours)

9- Daily nutritional and vitamins requirements (2 hours)

10- Breastfeeding (1 hour)

11- Nutrition of infants and children (2 hours)

12- Malnutrition (2 hours)

13- Chronic diarrhea and malabsorption syndromes (2 hours)

14- Avitaminosis (1 hour)

15- Health and prevention medicine in children (4 hours)

16- Neonatal infections (2 hours)

17- Intrauterine infections (1 hour)

18- Diarrhea and vomiting and dehydration and their prevention (3 hours)

19- Water and electrolytes, ORS therapy (2 hours)

20- Common genetic and metabolic disorders (2 hours)

21- Nervous and muscular system disorders in infant and children, floppy infant syndrome (2 hours)

22- Meningitis and encephalitis (2 hours)

23- Convulsion of children and infants (1 hour)

24- Tuberculosis (2 hours)

25- Whooping cough (1 hour)

26- Diphtheria (1 hour)

27- Tetanus (1 hour)

28- Poliomyelitis (1 hour)

29- Measles (1 hour)

30- Acute rash diseases in children (1 hour)

31- Mumps (1 hour)

32- Hepatitis: causes and complications in 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 (1 hour)

40- Acute glomerulonephritis and acute nephrotic syndrome (1 hour)

41- Common cardiovascular anomalies and heart failure (3 hours)

42- Acute rheumatic arthritis (1 hour)

43- Rheumatoid arthritis and systemic lupus erythematosus (1 hour)

44- Acute osteomyelitis, cellulitis (1 hour)

45- Acute arthritis (1 hour)

46- Immunity and allergy in infant and children (1 hour)

47- Common skin diseases in infant and children (1 hour)

48- Children and infantile diabetes (2 hours)

49- Hypothyroidism (1 hour)

50- Calcium and vitamin D metabolism disorders and rickets and hypocalcemia in infant and children (2 hours)

51- Genitourinary system diseases in infant and children and ambiguous. (1 hour)

52- Hemorrhagic diseases (1 hour)

53- Heart failure in infant and children (1 hour)

54- Anemia (2 hours)

55- Shock and coma (1 hour)

56- Accidents and poisoning and its prevention (1 hour)

57- Common malignant diseases in children (2 hours)

58- Common psychological and behavioral diseases, educational problems, mental health and mental retardation in children (2 hours)

59- Effect of drugs on the embryo, fetus and neonate (1 hour)

60- Abdominal mass in infant and children (1 hour)

61- Interaction between fetus and mother (1 hour)

62- Respiratory diseases in neonate and infant (1 hour)

63- Common metabolic disorders in neonate and infant (2 hours)

64- Short stature (1 hour)

65- Muscular diseases in children (2 hours)

66- Hypertension in children (1 hour)

67- Vomiting in infants and children (1 hour)

68- Wrong beliefs about inadequate of breastfeeding (0.5 hour)

69- Social and familial support of breastfed mothers (0.5 hour)

# Obstetrics and Gynecology

Credits: 4

Theoretical (68 hours)

Curriculum:

A- Obstetrics:

1- Definition of obstetrics and vital statistics (1 hour)

2- Genital system anatomy (1 hour)

3- Physiology of menstruation and ovulation (1 hour)

4- Zygote, implantation, structure of placenta and membranes (1 hour)

5- Physiology of placenta (1 hour)

6- Pregnancy (symptoms and signs, and deferent diagnostic methods) (1 hour)

7- Embryology (embryonic development and amniotic fluid) (1 hour)

8- Clinical examination and taking history of laboring woman (1 hour)

9- Physiologic changes in pregnancy (2 hours)

10- Pelvic structure and abnormal types (1 hour)

11- Presentation, position, station, engagement (1 hour)

12- Prenatal care and deferent complaints in pregnancy (like: vomiting) (2 hours)

13- Physiology of labor and its signs (1 hour)

14- Normal delivery and its stages (1 hour)

15- postpartum Care (1 hour)

16- Breech delivery (1 hour)

17- Delivery in occipito posterior, brow, face and shoulder presentation (1 hour)

18- Induction (1 hour)

19- Dystocia (pathologic contractions, pelvic stricture, macrosomia, malformations, abnormal presentation) (2 hours)

20- Fetal distress, fetal health methods (1 hour)

21- Preterm labor, post term pregnancy (1 hour)

22- Intra uterine growth retardation (1 hour)

23- Multiple pregnancy (1 hour)

24- The third trimester vaginal bleeding (placental abrution, placenta previa) (2 hours)

25- Types of placenta, placenta and umbilical malformations (1 hour)

26- Postpartum complications (infections, bleeding, thrombophlebitis, breast problems) (2 hours)

27- Blood groups incompatibility (1 hour)

28- Trophoblastic diseases (2 hours)

29- Vacuum and forceps (1 hour)

30- Cesarean section, vaginal injuries, causes of postpartum hysterectomy (2 hours)

31- Hydramnios, oligoamnius, fetal malformations (hydrocephalus, anencephalus, meningocele) (2 hours)

32- Hypertensive diseases in pregnancy (2 hours)

33- Preterm rupture of membranes (1 hour)

34- Heart diseases and urinary system diseases in pregnancy (1 hour)

35- Diabetes and pregnancy (1 hour)

36- Abortions (1 hour)

37- Ectopic pregnancy (1 hour)

38- Neonate resuscitation (1 hour)

B- Gynecology

39- clinical examination and paraclinical assessments in gynecology diseases (1 hour)

40- Puberty and menopause (1 hour)

41- Dysmenorrhea (1 hour)

42- Vulvovaginal diseases (1 hour)

43- Vaginitis and cervisitis (1 hour)

44- Benign diseases of cervix and uterus (polyps, hyperplasia) (2 hours)

45- Malignant cervical diseases (sampling and smear examination, biopsy) (1 hour)

46- Malignant diseases of uterus and fallopian tubes (1 hour)

47- Benign ovary diseases (1 hour)

48- Malignant ovary diseases (1 hour)

49- Abnormal uterine bleeding (1 hour)

50- Pelvic inflammatory disease (1 hour)

51- Amenorrhea (2 hours)

52- infertility (2 hours)

53- Endometriosis (1 hour)

54- Tuberculosis of genital system (1 hour)

55- Congenital malformations of genital system (1 hour)

56- Contraceptive methods (2 hours)

## Public health 3 – family and population health

Credits: 2

Theoretical (24 hours)

Prerequisite: principle of health services

Curriculum:

1- human ecology (definition, field, studies and problems in human ecology, humane environment) (1 hour)

2- humane society (definition, society, population, the role of family in structure of society) (1 hour)

3- Study of population (population and its structure, process of population change) (1 hour)

4- Population policies and family planning (1 hour)

5- Definition and field of family health services (1 hour)

6- Important characters in family health (birth rate, fertility rate, mortality and morbidity rate, life expectancy) and population growth rate and its changes. (2 hours)

7- Health and cares before marriage, pregnancy and preparation for lactation (1 hour)

8- Pregnancy and its symptoms and signs, gestational health cares and maternal preparation for lactation and their effects on mother and neonate health and decreasing of their mortality and morbidity rate. (4 hours)

9- Health care in childbirth, post partum and lactation period (1 hour)

10- At-risk pregnancies and neonates (1 hour)

11- Family planning and its clinical aspects, normal and preterm neonatal health care, other at-risk neonatal health care. (2 hours)

12- A- normal neonate health care and mother-neonate roommate (1 hour) B- premature and at-risk neonate health care (1 hour)

13- Epidemiology and control of diarrheal diseases (5 hours)

Definition, importance, epidemiology and pathology of diarrheal diseases (diarrhea due to E-coli, cholera, salmonella, shigella, vibrios, parasite) (1 hour)

Definition and dehydration types and their degrees (question, observation, palpation and weighting) (1 hour)

Treatment of diarrhea, prevention and treatment of dehydration (intravenous fluids, oral fluids like O.R.S (Oral Rehydration Solution). and their reasons and utilizations), the role of breastfeeding, dietary regimen, antibiotics and antidiarrheal drugs. (2 hours)

The role of breastfeeding, learning health, food health, environmental sanitation, prevention of diarrheal diseases with flies control (1 hour)

Other important diseases (4 hours)

Common important infectious diseases in Iran (tuberculosis, brucellosis, malaria)

Essential diseases in Iran (rabies, leprosy and so on)

Epidemiology and control of non contagious diseases (cancers, rheumatism, cardiovascular diseases, accidents, poisonings and so on)

## Public health 2 – Principle of epidemiology and diseases control

Credits: 2

Theoretical (34 hours)

Prerequisite: Principle of health services

Curriculum:

- Definition of epidemiology, ecology of diseases (1 hour)

- Common terms in epidemiology (1 hour)

- Physical, chemical and biological virulent factors (4 hours)

- Host factors (1 hour)

- Physicochemical, environmental, biological and social factors (1 hour)

- Prevention and its levels (2 hours)

- Epidemiological studies (3 hours)

- Epidemic analysis: (data collection, classification, View by Time Location and person), statistics in epidemiology. (6 hours)

- Epidemiology and vaccination, expanding program of immunization (E.P.I) (6 hours)

- Six preventable diseases by vaccination and immune mechanism (innate and acquired) (2 hours)

- Vaccination, production and preservation (cold chain) and its utilization. (2 hours)

- How to manage a vaccination center, evaluation of E.P.I. (2 hours)

- Occupational health, occupational diseases and their prevention (4 hours)
- Health services system in the world and Iran, international organizations (2 hours)
- Deferent levels of health services in health and treatment centers (2 hours)
- Management, planning and evaluation in Iranian health and treatment services (2 hours)

## Public Health 1 – Principle of Health Services

Credits: 2

Theoretical (34 hours)

Prerequisite: None

Curriculum:

- Definition and concepts of public health, field of public health (2 hours)
- Health in Islam (2 hours)
- Current situation of health and treatment in Iran, how to determine health needs in urban and rural societies, importance of primary health care. (2 hours)
- Important factors in primary health care (2 hours)
- Learning health importance in different program and effect on public cooperation (2 hours)
- Environmental health (preparation of enough healthy water, water sanitation, water borne diseases, characteristic of its epidemic, food-borne diseases, sanitation of food product and distribution, air pollution and air-borne diseases
- Mother and children Health care (pre-school and school health care) and population, birth intervals, the role of breastfeeding (2 hours)
- National program for control of common and endemic diseases (2 hours)
- Vaccination against common infectious diseases (2 hours)
- Occupational health, occupational diseases and their prevention (4 hours)
- Health services system in the world and Iran, international organizations (2 hours)
- Deferent levels of health services in health and treatment centers (2 hours)
- Management, planning and evaluation in Iranian health and treatment services (2 hours)

# Regulations of intern's duties in medical doctorate degree

Intern is a medical student in the final medical doctorate degree who has passed theoretical, practical and training courses. They are allowed to practice medicine under supervision of professors to acquire medical skills to get medical doctorate degree. Head of the group and the ward are responsible for interns at all. The physician or on-call professor or on-call chief resident are responsible for interns in shift hours. Emergency cases in these regulations are diagnosed by physician and in shift hours by doctor, on-call professor or chief resident of hospital. The physician is someone who admits the patients in the hospital.

Intern's duties:

A- Principle

1- Notice and respect to medical ethics in all hours in hospital

2- Notice and respect to rules the group, the ward, hospital, medical school and university

3- Notice and respect to regulations and rules of ministry of health, treatment and medical education

B- Rules about patients and their medical documents

4- History taking, clinical examination, evaluation, diagnostic and therapeutic program of all admitted patients in causal and shift time and discuss about appropriate differential diagnosis.

5- Visit in-patient cases in the ward before visiting by physician or resident

6- Receive the laboratory results and assess of the last paraclinical reports

7- Write and fill sheet disease

8- Write medical orders under supervision of physician or resident

9- Write on and off service notes

10- Write briefs under supervision of physician or resident in the ward

11- Write the consultation form under supervision of physician or resident in the ward

12- Write the request form of imaging: CT scan, MRI, radiography, ultrasound, endoscopy, angiography and all of paraclinical request form

13- Presence beside the patient and do cardiopulmonary resuscitation

14- Presence beside critical patients, patient who needs intensive care and every patient who needs to visit again.

15- measure vital signs and take care of patient after invasive diagnostic procedures like liver biopsy, kidney biopsy, water restriction or glucose tolerance test and insulin challenge test under supervision of physician or responsible resident in the ward

16- accompany the critical patients with unstable vital signs and patients who need medical special care to transport to other ward or hospital

C- Therapeutic and diagnostic procedure:

17- Intern should do the procedures:

Nasogastric tube insertion, foley catheterization, sampling of arterial blood gas (ABG), preparation of peripheral blood smear, wound sampling, pharynx swab culture, suturing, pure protein derivatives (PPD), interpretation of electrocardiography, debridement of infectious wound under supervision of physician, ear cleaning, anterior nasal packing, checking of packed cell and blood products for transfusion

18- these skills only with agreement of physician are done by interns

writing prescription of admitted patient, orotracheal intubation and airway insertion, vaginal delivery management, induction and control of fetal heart rate (FHR) and uterine contraction and fetal movement, intrauterine device insertion, curettage, foreign body removal of ear, pharynx, nose and eye, cautery of nasal hemorrhage, skin traction, lumbar puncture (LP), splinting, casting, aspiration and biopsy of bone marrow, puncture of knee joint, intrathecal injection, intra articular injection, simple surgery like circumstance, excise of superficial mass, ingrowing nail, abscess drainage, suprapubic sampling, fixation of chest tube, tap of pleural effusion and ascites, colon washout, exchange of nephrostomy or cystostomy tube, supra pubic drainage, umbilical venous catheterization, blood exchange of neonate, urinary catheterization in infants, cut down and any invasive diagnostic and therapeutic procedures that should be suggested in educational program.

19- These skills should be taught to interns during maximum 6 months:

Injection, intravenous cannulation, venous blood sampling, blood culture sampling, electrocardiography, gram staining, simple dressing, interpretation of urine analysis and peripheral blood smear, suction of pharyngeal and tracheal tube excretion, respiratory physiotherapy,

20- The necessary and emergency cases should be done by intern:

Control and chart of vital sign and intake/output, stomach excretion sampling, cast cutting, phlebotomy, writing paraclinical request form, transport sample to laboratory, accompany with patient to another ward, ventilation with Ambu bag, continuous standby beside the patient, chemotherapy, transport packed cell,

D- Corporation in educational conferences:

21- Intern should visit the patient with physician or resident in active and regular attendance

22- The intern should take history, do clinical exam and present the patient to physician or resident in out-patient clinic.

23- Introduce the critical patients to intern in the next shift.

24- Regular and active attendance in the all educational conferences like: morning report, scientific conferences, management classes, operative rooms, training rounds.

25- Presentation the patients in morning report or other conferences under supervision of physician and resident like: brief presentation of patient, reason of admission, differential diagnosis, reason of paraclinical request and interpretation of their results, treatment.

26- Prepare the scientific conferences

E- Attendance in hospital

27- The head of the group, ward or medical school regulates for interns the time duration of attendance in hospital.

28- Maximum of shift numbers are 10 nights a month. Minimum shift numbers in internal medicine, surgery, pediatrics, obstetrics and gynecology ward are 8 night a month.

29- The physician or resident or chief intern regulates the intern's shifts and rotation program.

30- It is not possible to change shifting program except with previous inform or in urgency cases with agreement of physician or resident.

31- It is forbidden to leave the shift except in emergency cases with agreement of physician or resident.

32- It is possible to exit of hospital in usual time with agreement of physician or resident

33- Educational conferences and sessions are very important to attend.

34- According to last rule of ministry of health, treatment and medical education, health internship is one-month course.

35- Any violation of interns from their duties will have legal action by the group, ward, hospital, medical school or finally judicial.

36- The head of the group, ward and educational hospital are responsible to perform the regulations in the best way.