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**Kfrelsheikh University**

**Faculty of Medicine**

**Department of Histology**

Course Specifications

**Course title:** **Histology for first year**

**Code:**

**Department offering the course Histology Department**

**First academic year of M.B. B.Ch. program**

**Date of specification approval**

* 1. **BASIC INFORMATION:**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Allocated marks:** | 150 | marks |
|  | **Course duration:** | 30 | weeks |

**Teaching hours:** 120 Total hours

Theoretical 60hours

Tutorial and practical 60 hours

**B) PROFESSIONAL INFORMATION:**

**1- Overall Aim of the Course:**

To inform students the different histological tools and techniques.

To teach the students the basic histological structures of different cells and tissues of human body, preparing them for studying organs and systems in the second term & second year

To make correlation between function and structure of various tissues and their clinical significance

**2- Intended Learning Outcomes (ILOs):**

**a. Knowledge and understanding:**

***By the end of the course, students should be able to:***

1. Define and describe the histological characteristics of normal cells (a.1,2 and3)
2. Differentiate between normal and abnormal karyotyping (a.1,2 ,3 and9)
3. Describe and compare between different blood cells (a.1,2 and3)
4. Define and discuss the basic histological tissues of the body (General histology) and some systems in the second term (Vascular, Lymphatic, & skin) (a.1,2 and3)
5. Recognize basics of ethics (a.14)

**b. Practical skills:**

***By the end of the course, students should be able to:***

1. Identify various types of stains and micro techniques.(b.1)
2. Identify different cell organelles in projector slides (a.1, 2 and3)
3. Identify different blood cells in blood films seen in projector slides. (a.1, 2, 3 and b.1)
4. Identify different types of epithelium, connective tissue cells, connective tissue proper & bone cells. (a.1, 2, 3 and b.1)
5. Differentiate between tissues and organs in histological slide seen under the microscope. (a.1, 2, 3 and b.1)
6. Do a total red & white count using the hemocytometer. (b.1)
7. Do a differential leucocytic count using the blood film. (b.1)

**c. Professional attitude and behavioral skills:**

***By the end of the course, students should be able to:***

1. Respect and follow the institutional code of conduct.(c.6)
2. Maintain professional image in manner, dress speech and interpersonal relationships that is consistent with the medical profession's accepted contemporary standards in the community. (c.6 and d.5)

**d. Communication skills:**

***By the end of the course, students should be able to:***

1. Communicate effectively with individuals regardless of their social, cultural, ethnic backgrounds, or their disabilities.(d.2)
2. Express themselves freely and adequately by improving their descriptive capabilities and enhancing their communication skills.(d2)
3. Honor and respect, superiors, colleagues and any other member of the health profession.(d.5)

**e. Intellectual skills:**

***By the end of the course, students should be able to:***

1. Correlate between histological structure & function of any cell or tissue (a.1,2 and3) (e.1)
2. Diagnose slides different from those seen during his course but of the same organs or tissues previously studied (a.1,2 ,3 and b1) (e.1)
3. Distinguish between normal and abnormal karyotyping (a.9) (e.1)
4. Interpret a complete blood picture report.(e1)

**f. General and transferable skills:**

***By the end of the course, students should be able to:***

1. Use the sources of biomedical information to remain current with advances in knowledge and practice.(f.2)
2. Present information clearly in written, electronic and verbal forms. (f.3 and f.8)
3. Frame a question, search and literature, collect, analyze, critically appraise and utilize the obtained information to solve a particular clinical problem according to the principles of evidenced based medicine.(a.8 and f.5)
4. Appreciate the importance of life long learning and show a strong commitment to it. (f.2)

**3- COURSE CONTENTS:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Subject** | **Lectures** | **Tutorial** | **Total** | **% of** |  |
|  | **(hrs)** | **&Practical** | **(hrs)** | **Total** |  |
|  |  | **(hrs)** |  |  |  |
| **1-Introduction,** | **2** | **3** | **5** | **4.2%** |  |
|  |  |  |
| **Micro techniques** |  |  |  |  |  |
|  |  |  |  |  |  |
| **2-Cytology** | **7** | **6** | **13** | **10.8%** |  |
|  |  |  |
|  |  |  |  |  |  |
| **3- Cytogenetics** | **6** | **3** | **9** | **7.5%** |  |
|  |  |  |
|  |  |  |  |  |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **4- Epithelium** | **5** | **6** | **11** | **9.2%** |  |
|  |  |  |
|  |  |  |  |  |  |
| **5- Connective Tissue** | **4** | **6** | **10** | **8.3%** |  |
|  |  |  |
|  |  |  |  |  |  |
| **6- Cartilage** | **2** | **3** | **5** | **4.2%** |  |
|  |  |  |
|  |  |  |  |  |  |
| **7- Bone** | **5** | **6** | **11** | **9.2%** |  |
|  |  |  |
|  |  |  |  |  |  |
| **8- Blood** | **7** | **6** | **13** | **10.8%** |  |
|  |  |  |
|  |  |  |  |  |  |
| **9- Muscle** | **4** | **3** | **7** | **5.8%** |  |
|  |  |  |
|  |  |  |  |  |  |
| **10- Nervous tissue** | **6** | **6** | **12** | **10%** |  |
|  |  |  |
|  |  |  |  |  |  |
| **11- Vascular** | **2** | **3** | **5** | **4.2%** |  |
|  |  |  |
|  |  |  |  |  |  |
| **12-Lymphatic** | **5** | **3** | **8** | **6.7%** |  |
|  |  |  |
| **System** |  |  |  |  |  |
|  |  |  |  |  |  |
| **13- Skin** | **3** | **3** | **6** | **5%** |  |
|  |  |  |
|  |  |  |  |  |  |
| **14- Receptors** | **1** | **3** | **4** | **3.3%** |  |
|  |  |  |
|  |  |  |  |  |  |
| **15-** | **1** |  | **1** | **0.8%** |  |
|  |  |  |  |
| **Reticuloendothelial** |  |  |  |  |  |
| **system** |  |  |  |  |  |
|  |  |  |  |  |  |
| **Total (120 hours)** | **60** | **60** | **120** | **100%** |  |
|  |  |  |
|  |  |  |  |  |  |

**III-A) TOPICS:**

**1-Introduction, micro technique and cytology**

Histology is the science dealing with the study of the normal microscopical structure of tissues. It helps the student to correlate between the structure & function of tissues and organs. It also, prepares the student to study histopathology.

**2-Cytology**

General structure of the cell

Cytoplasmic contents (organelles & inclusion)

Classification of organelles into membranous & non- membranous organelles

LM, EM , molecular biology & functions of cell membrane Cell coat & its functions

Mitochondria Golgi complex

Endoplasmic reticulum Lysosomes

Peroxisomes

All of the above membranous organelles are described as regarding their EM and LM pictures, molecular biology and function

Non - membranous organelles:

Ribosomes, Centrioles, Cilia, Flagella, Microtubules & microfilaments. Regarding their LM, EM, molecular biology & function

Cell inclusions

Structure of the nucleus (LM& ~M) & its functions Molecular biology of DNA

Types of RNA & protein synthesis

**3- Cytogenetics**

Cell division ( mitosis & meiosis) Cell cycle & interphase

Chromosomal number & sex chromosomes

Karyotyping & classification of chromosomes Structure of chromosomes

Sex chromatin

Abnormalities of cell division

Causes of chromosomal aberrations

Aberrations in chromosomal number, e.g. Mongolism Aberrations in chromosomal structure

Aberrations of sex chromosomes e.g. Turner & Kleinfelter syndromes Blood groups

**4- Epithelium**

General characteristics of epithelium & its types Types of simple epithelium (structure & sites)

Transitional epithelium

Structure & sites of stratified squamous & stratified columnar epithelium Glandular epithelium with reference to sites

Neuro- and myo-epithelium with reference to sites General functions of epithelium

Modifications of epithelial cells surfaces: Apical basal & lateral modifications

**5- Connective tissue (C.T.)**

General characteristics & Types of C.T.Cells of C.T. proper (LM, EM & function)

Cells of C.T. proper (continuation) Fibers of C.T.

Ground substance

Types of C.T. proper with reference to sites General functions of C.T. proper

**6- Cartilage**

Types of cartilage

Histology of each type Sites of each type

General functions

**7- Bone**

Types of bone with reference to sites

Methods of preparation of bone sections Histology of compact bone

Bone cells & their functions Histology of spongy bone

Differences between cartilage & bone

Ossification (intramembranous & intracartilagenous)

**8-Blood**

What are the blood elements?

Normal structure, size & number of erythrocytes

Abnormalities in structure, size & number of RBCs Polycythaemia & anemia ad their causes

How the RBCs are adapted to perform their function Differences between RBCs & WBCs

Types of WBCs & normal % of each

Total leucocytic count & its clinical importance Differential leucocytic count & its importance Detailed structure & function of neutrophils

Detailed structure & function of eosinophils Detailed structure & function of basophils Structure & function of lymphocytes

Structure & function of monocytes Structure & function of platelets

Types & structure of bone marrow Erythropoiesis

Granulopoiesis

Development of lympocytes Development of monocytes Development of platelets

**9- Muscular tissue**

General histological structure of muscle cells (fibers) Types & action of muscles

Skeletal muscle

Skeletal muscle fibers (LM & EM) Types of skeletal muscle fibers

EM picture of myofibrils

Mechanism of muscle contraction Smooth muscle fibers (LM & EM) Cardiac muscle fibers (LM & EM) Conducting system of heart

Purkinje muscle fibers

**10- Nervous tissue**

Definition of the neuron

Types (classification) of neurons & examplesEM) Dendrites & axons

Types of nerve fibers with examples Histology of peripheral nerve fibers Structure of nerve trunk

Spinal & autonomic ganglia Synapse

Causes of degeneration

Retrograde degeneration Wallarian degeneration

Traumatic & transneural degeneration

Stains used for detection of degeneration Regeneration

Definition of neuroglia Classification & sites

Detailed structure of proper neuroglia cells General functions of neuroglia

Endings in muscular tissue

Pacinian corpuscle with reference to sites & function histology of the nerve cell (LM &

Muscle spindle (LM & EM) Motor end plate (LM & EM)

**11- Skin Integument**

Definition

Types & sites of skin

Histology of thick non-hairy skin Histology of thin hairy skin

Hair, hair follicles & nails Color of skin & melanin

Skin glands (sweat & sebaceous glands)

**12- Blood vascular system**

General structure of blood vessels & its significance Large, medium sized & small arteries

Small, medium sized & large veins

Structure of special blood vessels e.g. basilar, coronary, umbilical & penile arteries

Types, sites & structure of capillaries

Blood sinusoids with reference to their sites AV shunt

**13- Lymphatic system**

Lymph vessels & distribution of Iymphoid tissue

Lymph node & its immunological function Spleen & its function

Differences between lymph node & spleen

Blood supply of spleen & theories of circulation Tonsils

Structure & functions of thymus Thymic barrier

**14- Immune system & RES**

Cells involved in the immune system & their functions Antigen presenting cells

Cells of RES & method of their demonstration

**III-B) Tutorial / Small Group Discussions**

1. Introduction and micro techniques
2. Cytology
3. Cytogenetics.
4. Epithelial tissue
5. Connective Tissue
6. Cartilage
7. Bone
8. Blood
9. Muscular Tissue
10. Blood vessels
11. Lymphatic system
12. Integumentary system
13. Nervous tissue
14. Receptors

**III-C) PRACTICAL CLASSES:**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **-List of projector slides** |  | **-List of glass slides** |
|  |  |  |  |
| 1. | EM picture of cell membrane. | 1. | Umbilical cord |
|  |  |  |  |
| 2. | EM picture of mitochondria | 2. | Hyaline cartilage |
|  |  |  |  |
| 3. | EM picture of Golgi apparatus | 3. | Elastic cartilage |
|  |  |  |  |
| 4. | EM picture of rough endoplasmic | 4. | Ground compact bone |
|  | reticulum |  |  |
|  |  |  |  |
| 5. | EM picture of smooth endoplasmic | 5. | Decalcified compact bone |
|  | reticulum |  |  |
|  |  |  |  |
| 6. | EM picture of lysosomes | 6. | Spongy bone |
|  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 7. | EM picture of centrioles | 7. | Intercartilagenous ossification |
|  |  |  |  |
| 8. | EM picture of cilia | 8. | Skeletal muscle longitudinal |
|  |  |  | section |
|  |  |  |  |
| 9. | EM picture of microvilli | 9. | Skeletal muscle transverse |
|  |  |  | section |
|  |  |  |  |
| 10. | Blood film showing neutrophils | 10. | Cardiac muscle and valve |
|  |  |  |  |
| 11. | Blood film showing eosinophils | 11. | Moderator band |
|  |  |  |  |
| 12. | Blood film showing basophils | 12. | Nerve trunk (H & E) |
|  |  |  |  |
| 13. | Blo | 13. | Nerve trunk (osmic acid) |
|  | od film showing lymphocytes |  |  |
|  |  |  |  |
| 14. | Blood film showing monocytes | 14. | Spinal ganglion (H & E) |
|  |  |  |  |
| 15. | Blood film showing platelets | 15. | Spinal ganglion (Ag) |
|  |  |  |  |
| 16. | Bone marrow smear showing | 16. | Sympathetic ganglion (Ag) |
|  | megakaryocyte |  |  |
|  |  |  |  |
| 17. | Simple squamous epithelium | 17. | Medium size artery and vein |
|  |  |  |  |
| 18. | Simple cubical epithelium | 18. | Aorta |
|  |  |  |  |
| 19. | Simple columnar epithelium | 19. | Basilar artery |
|  |  |  |  |
| 20. | Pseudo stratified columnar ciliated with | 20. | Lymph node |
|  | goblet cells |  |  |
|  |  |  |  |
| 21. | Stratified squamous keratinized | 21. | Spleen |
|  | epithelium |  |  |
|  |  |  |  |
| 22. | Stratified squamous non keratinized | 22. | Palatine tonsil |
|  | epithelium |  |  |
|  |  |  |  |
| 23. | Transitional epithelium | 23. | Thymus |
|  |  |  |  |
| 24. | Loose areolar connective tissue | 24. | Pacinian corpuscle |
|  |  |  |  |
| 25. | Adipose connective tissue Sudan | 25. | Motor end plate |
|  |  |  |  |
| 26. | Regular white collagenous connective | 26. | Muscle spindle |
|  | tissue |  |  |
|  |  |  |  |
| 27. | Irregular white collagenous connective | 27. | Hassall’s corpuscle |
|  | tissue |  |  |
|  |  |  |  |
| 28. | Yellow elastic connective tissue | 28. | Taste bud |
|  |  |  |  |
| 29. | Reticular connective tissue |  |  |
|  |  |  |  |

1. Fibroblasts
2. Plasma cells
3. Pigment cell

**-Data show photos of sections previously studied in slides but from different sources**

**4- TEACHING AND LEARNING METHODS:**

METHODS USED:

1. Lectures
2. Tutorials
3. Practical classes

TEACHING PLAN:

**Lectures:** Division of students into five groups twice /week

**Tutorials & Practical classes**: Division of students into five groups once / weekThe practical training in the labs is every week. The students will be organized by dividing them into 5 big groups, one group each day, and then each group is divided into 4 smaller sub- groups in 4 labs simultaneously. These Subgroups of students allow interaction, presentations and feedback. The plan for practical training is attached in instructional units section. Each lab includes presentation of the scheduled topic by one of the staff, and explanation of the slides. Then the students examine the slides themselves helped by joiner staff aided with microscopes, projector slides, data show photos. The tutorial data show photos of sections of tissues and organs similar to those studied in practical lab but of different and variable sources for training and Quizzes. This is carried by senior staff members.

Time plan:

|  |  |  |
| --- | --- | --- |
| **Item** | **Time schedule** | **Total hours** |
| Lectures | twice / week | 60hours |
|  |  |  |
| Tutorial & | once / week | 60 hours |
| Practical |  |  |
|  |  |  |
| Revision | two weeks/semester |  |
| Mid-year | two weeks |  |
| exam |  |  |

|  |  |  |
| --- | --- | --- |
| **Total** | **30 weeks** | **120** |

**5- STUDENTS ASSESSMENT METHODS:**

5-A) ATTENDANCE CRITERIA: Faculty bylaws

**The minimum acceptable attendance is 75%, Students who fail to meet their**

**attendance requirements are deprived of their final practical exams.**

5-B) Assessment TOOLS:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tool** |  |  | **Purpose (ILOs)** |  |
| Written examination | To assess knowledge and understanding and skills | | |  |
| Mid year exam : short |  |
|  |  |  |  |
| questions MCQ, true &false & |  |  |  |  |
| matching |  |  |  |  |
| End of year: short& long |  |  |  |  |
| questions , drawings, |  |  |  |  |
| MCQ, true and false, |  |  |  |  |
| matching |  |  |  |  |
|  |  |  | |  |
| Oral examination end of | To assess of knowledge & understanding, general and | | |  |
| year | transferable skills (communication), professional | | |  |
|  | attitudes/skills & intellectual skills | | |  |
| Practical | To assess descriptive & diagnostic abilities (intellectual | | |  |
| examination(OSPE) | skills) and practical skills | | |  |
| practical book plus | To assess practical skills and to assess attendance. | | |  |
|  |  |  |  |
| problem solving |  |  |  |  |
|  |  |  |  |  |
| Group assignments | To assess of communication skills | | |  |
|  |  |
|  | To assess of ability to use computer to reach biomedical | | |  |
|  | information. | |  |  |
| 5-C) TIME SCHEDULE: | Faculty bylaws | |  |  |
|  |  |  |  |  |
| Exam |  |  | Week |  |
| 1- First half of the academic year | |  | November fourth week |  |
| 2- Mid-year exam |  |  | January second week |  |
| 3- Second half of the academic year | |  | March fourth week |  |
| 4- Practical exam |  |  | May first week |  |
| 5- Final exam |  |  | June fourth week |  |

5-D) GRADING SYSTEM:

|  |  |  |  |
| --- | --- | --- | --- |
| **Examination** | **Marks allocated** | **% of Total Marks** |  |
| 1- First mid term | 5 | 3.3% |  |
| 2- Mid-year | 20 | 13.3% |  |
| 3- Second mid term | 5 | 3.3% |  |
| 4- Final exam: | 75 | 50% |  |
| a- Written |  |
| b- Practical | 25 | 16.7% |  |
| c- Oral | 15 | 10% |  |
| 5- Assignments & other | 5 | 3.3% |  |
| activities |  |  |  |
| **Total** | **150** | **100%** |  |

The minimum passing & Passing grades (Faculty bylaws).

The minimum passing score is 60% provided at least 40% are obtained in the final written exam. Passing grades :

Excellent 85%

Very good 75%

|  |  |
| --- | --- |
| Good | 65 % |
| Fair | 60– 65 |

FORMATIVE ASSESSMENT:

Student knows his marks after the Formative exams.

5-E) Examinassions description:

|  |  |  |
| --- | --- | --- |
| **Examination** | **Description** |  |
| 1- First midterm | Short questions |  |
| 2- Mid-year | Matching, true& false, MCQ, case studies and problem |  |
|  |  |
|  | solving |  |
|  |  |  |
| 3- Second midterm | OSPE identification of tissues and organs in data show photos |  |
| 4- Final exam: | Long question, short questions, matching, true& false, |  |
| a- Written |  |
| MCQ, case studies and problem solving |  |
|  |  |
| b- Practical | OSPE identification of tissues and organs in slides using |  |
|  | microscopes. |  |
|  | OSPE identification of tissues and organs in data show |  |
|  | photos. |  |
| c- Oral | Uses viva cards each student selects three cards 5 marks |  |
|  | each. |  |
|  |  |  |
| 5- Assignments & | Assignments and practical book |  |

other activities

**6- LIST OF REFERENCES:**

6.1- Basic materials:

Department book: constructed by staff members. Department’s colored atlas book.

Department’s practical book 6.2- Essential books (text books):

Basic histology text and atlas 6.3- Recommended books:

Wheater’s functional histology

**7- FACILITIES REQUIRED FOR TEACHING AND LEARNING:**

Facilities used for teaching this course include:

Lecture halls: five grand lectures halls allocated daily for teaching central lecture halls).

Small 4 well equipped labs available within the department. Two small lecture rooms available within the department.

Six data show equipments and computers for slide and photo presentation. Microscopes.

Writing boards are available in all rooms; overhead aids and slide projectors. Microscopic slides.

**Course coordinator:**

Associate Prof. **Dr Maha Abo Gazia**

**Head of Department:**

**Date:** 1**/8** **/**2016