Ministry of Education and Science of Ukraine
V. N. Karazin Kharkiv National University

FUNDAMENTALS OF EMBRYOLOGY

Methodical guidance
for the 1st academic year students of the School of Medicine

Electronic resource

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F 97

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Fundamentals of Embryology : methodical guidance for the 1st academic year
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Methodical guidance contains basic recommendations for preparing first-year medical students for classes and exams in the elective discipline “Fundamentals of Embryology”. Developed for applicants for higher medical education in higher medical educational institutions of Ukraine III-IV accreditation levels: higher educational level Second (Master of Medicine), field of knowledge “22 Healthcare”, specialty “222 Medicine”, qualification “Doctor”.

UDC 611.013(072)

CONTENTS

GENERAL DESCRIPTION OF THE «FUNDAMENTALS OF EMBRYOLOGY»DISCIPLINE

The discipline "Fundamentals of Embryology " occupies a very important place in the educational program of the Faculty of Medicine, as it studies the fetal development of the human body and provides the acquisition of basic knowledge necessary for the successful study of special medical disciplines.

The purpose of the academic discipline "Fundamentals of Embryology" is to provide students with knowledge of the fetal development of the human body. Mastering this course provides the basic knowledge necessary for the successful study of special medical disciplines.

Interdisciplinary connections: «Fundamentals of Embryology» as an educational discipline based on students' study of medical biology, anatomy and integrates with these disciplines; provides the basis for students to study pathological anatomy and propaedeutics of clinical disciplines, which involves the integration of teaching with these disciplines and the formation of the ability to apply knowledge of embryology in the process of further education, as well as in professional activities.

According to the Standard of higher education in the specialty 222 Medicine, the study of the discipline "Fundamentals of Embryology", in combination with other components of the educational and professional program, ensures that students of higher education acquire the following competencies:

General:

- Ability to think abstractly, to analyze and synthetize; ability to learn and master modern knowledge. (GC 01).
- Ability to apply knowledge in practical situations (GC 02).
- Knowing and understanding the subject area and understanding the professional activities (GC 03).
- Ability to adapt and to act properly in new situations (GC 04).

- Ability to make an informed decision; work in a team; interpersonal skills (GC 05).
- Skills in using information and communication technologies. (GC 06).
- Skills in the use of information and communication technologies; ability to search, process and analyze information from various sources (GC 07).
- Ability to act socially responsibly and consciously (GC 09).
- Ability to use information and communication technologies (GC 10).
- Ability to search, process and analyze information from various sources (GC 11).
- The ability to preserve and multiply moral, cultural, scientific values and achievements of society based on an understanding of the history and patterns of development of the subject area, its place in the general system of knowledge about nature and society and in the development of society, technology and technologies, to use various types and forms of motor activity for active recreation and leading a healthy lifestyle (GC 15).
- The ability to make decisions and act in accordance with the principle of inadmissibility of corruption and any other manifestations of dishonesty (GC 16).

Professional:

- Ability to collect medical information about the patient and analyze clinical data (PC 1).
- Ability to determine the necessary list of laboratory and instrumental studies and evaluate their results (PC 2).
- Ability to determine the principle and nature of treatment and prevention of diseases. (PC 6).
- The ability to assess the impact of the environment, socio-economic and biological determinants on the state of health of an individual, family, population (PC 17).

- Adherence to professional and academic integrity, to be responsible for the reliability of the obtained scientific results (PC 25).

According to the National Qualifications Framework and the educational and professional program of V. N. Karazin Kharkiv National University School of Medicine, applicants who have completed the educational course "Fundamentals of Embryology", must to:

- To have thorough knowledge of the structure of professional activity. To be able to carry out professional activities that require updating and integration of knowledge. To be responsible for professional development, the ability for further professional training with a high level of autonomy (PLO 1).
- Understanding and knowledge of fundamental and clinical biomedical sciences, at a level sufficient for solving professional tasks in the field of health care (PLO 2).
- Specialized conceptual knowledge, which includes scientific achievements in the field of health care and is the basis for conducting research, critical understanding of the problem in the field of medicine and related interdisciplinary problems, including the system of early intervention (PLO 3).
- To search for the necessary information in the professional literature and databases of other sources, analyze, evaluate and apply this information (PLO 21).
- To apply modern digital technologies, specialized software, statistical methods of data analysis to solve complex healthcare problems. (PLO 22).
- To assess the impact of the environment on the state of human health to assess the state of morbidity of the population (PLO 23).

TEACHING METHODS

Several classical and modern pedagogical approaches are used in teaching the discipline:

1. «Teacher-centered approach» or «direct instruction model» — conveying information to higher education students through lectures and instruction on learning.

2. «Student-centered approach» and «personalized learning», namely students'considerable freedom and independence in choosing topics for individual tasks and expressing their own opinions during its implementation.

3. «High-tech approach», namely the use of Web technologies to support access of students to the materials of the discipline, communication with the teacher and communication with other participants in the educational process.

4. Differentiated approach to methods of memorizing information, for in process of studying the material, students use both passive (reading and taking MCQ tests, viewing the presentations and videos) and active (answering the provided questions for self-check or control tests with written answers) methods of memorization.

THEMATIC PLAN OF THE DISCIPLINE

Characteristics of the educational discipline

Elective discipline	
Full-time education	
Year	1st
Semester	2nd
Lectures	–
Practical classes	30 hours
Independent work	60 hours

Thematic plan of the educational discipline

«Fundamentals of Embryology»

Topic 1. Medical Embryology: subject, tasks and historical aspects. Periods of human embryogenesis. Historical aspects of medical embryology. Subjects and tasks of medical embryology. Periodization of human embryogenesis.

Topic 2. Structure of the female reproductive systems.

Anatomical structure, histological characteristics of the structure and functional meaning of the female reproductive systems. The concept of the ovarian-menstrual cycle.

Topic 3. Structure of the female germ cells.

Structure and functions of female germ cells, the main stages of their development. Meiosis as a mechanism of germ cell formation. Transformation of primary gametes into female gametes. The concept of the ovulation. Disorders of germ cell development. The concept of gametopathy.

Topic 4. Structure of the male reproductive systems.

Anatomical structure, histological characteristics of the structure and functional meaning of the male reproductive systems.

Topic 5. Structure of the male germ cells. Spermatogenesis.

Structure and functions of male germ cells, the main stages of their development. Meiosis as a mechanism of germ cell formation. Transformation of primary gametes into male gametes.

Topic 6. The first week of fetal development. Fertilization.

Fertilization in humans, its biological significance, phases. Conditions necessary for normal fertilization. Capacitation, acrosomal reaction, penetration, formation of the male pronucleus. Cortical reaction, completion of meiosis, formation of the female pronucleus. Zygote as a unicellular organism.

Topic 7. Cleavage.

Characteristics of the process of cleavage of the human embryo. Structure and localization of the embryo during cleavage. Types of blastomeres. Morula. Embryo and trophoblast. Blastocyst formation.

Topic 8. Implantation. Biological processes underlying the development of the embryo. Formation of a two-layer embryonic disk. The main events of the 2nd week of embryogenesis.

Induction, determination, division, cell migration, growth, differentiation, cell interaction, destruction. Implantation, its mechanisms, stages and chronology.

Differentiation of trophoblast and embryoblast, formation of extraembryonic structures.

Topic 9. Gastrulation. Formation of Germ Layers. The main events of the 3d week of embryogenesis.

Gastrulation. Embryonic disc growth. Formation of Germ Layers. Formation of the axes of the embryo body. Delamination. Structures formed as a result of delamination. Development of embryonic mesoderm and endoderm. Development of extraembryonic structures.

Topic 10. Characteristics of the main events of the embryonic period. Histo- and organogenesis. Differentiation of embryonic leaves.

Embryo development in the period from the 3rd to the 8th week. Differentiation of embryonic leaves. Derivatives of embryonic and extraembryonic mesoderm, ectoderm and endoderm. Neurolation and formation of the axial complex of rudiments of organs. Changing the shape of the embryo's body. Disorders of fetal development in the embryonic period.

Topic 11. The Fetal Period.

Characteristics of the main events of the fetal period. Embryo from the 9th week of embryogenesis to birth. Assessment of fetal age. Extraembryonic (provisional) organs: chorion, amnion, yolk sac, allantois, umbilical cord, placenta. Disorders of fetal development in the fetal period.

Topic 12. Multifetal pregnancies.

Development of dizygotic and monozygotic twins. The structure of fetal membranes in multiple pregnancies. Disorders of embryogenesis in multiple pregnancies.

Topic 13. Critical periods of human development. Congenital malformations.

Critical periods of human development. Developmental defects.

Topic 14. Modern reproductive technologies.

The main tasks of reproductive science. In vitro fertilization.

INDEPENDENT WORK

1 - providing written answers to control questions;

2 - drawing diagrams and specimens, labling diagrams;

3 - tasks of distance courses: work with Web-resources on the topic, execution of graphic notes, performance testing tasks of closed and open type, including illustrated tests, which demonstrate the microscopic structure of human cells and tissue.

Type 1 tasks (written answers to control questions) are usually part of the homework and performed by a student during preparation for practical class.

Type 2 - 3 tasks can be a component of homework or performed by a student directly in practical classes (specific type of work is determined by the teacher).

Completion of tasks for independent work is obligatory. A student of higher education can receive a grade for a subject only if all tasks for independent work are completed.

Name of topics

Medical embryology: subject and tasks. General characteristics of the structure and functions of the female and male reproductive system

Structure of the female and male sex cells. Gametogenesis.

Developmentals Periods. The Beginning of Human Development: First Week. Fertilization and cleavage. Implantation. Biological processes underlying the development of the embryo. The main events of the 2nd week of embryogenesis.

Gastrulation. Formation of Germ Layers. The main events of the period from 3 to 8 weeks of fetal development.

Human skeletal and muscular systems: embryonic sources and the process of development. Formation of body cavities in human embryogenesis.

Human cardiovascular system: embryonic sources and developmental process

Human Digestive Systems: Embryonic Sources and Developmental Process

Respiratory Systems: Embryonic Sources and Developmental Process

Human urinary and reproductive systems: embryonic sources and developmental process

Embryonic sources and process of development of head and neck, nervous system and sense organs. Skin and its derivatives: embryonic sources and developmental process

Fetal period of embryogenesis. Extragerminal organs.

Multifetal pregnancies.

Congenital malformations.

Modern reproductive technologies.

Preparation for the final control

CONTROL METHODS

To determine the level of formation of knowledge and skills in the educational discipline "Fundamentals of Embryology", written and oral control is provided.

Written control is carried out in the form of test tasks of various types (closed and open-form tests, illustrated tests, including interactive test tasks of the Moodle distance learning system with automated verification).

Oral control in the form of an interview is carried out after the student of higher education has completed all educational activities by topic/subject to determine the level of formation of knowledge of theoretical content and practical skills.

Control of practical skills during testing and interviewing is implemented on the basis of assessing the ability of higher education students to work with a microscope, diagnose and analyze histological specimens and electronic microphotographs that reflect the microscopic structure of human cells and tissues. The control of practical skills makes it possible to find out to what extent the student has realized the theoretical foundations of these actions.

According to the curriculum of the discipline «Fundamentals of Embryology» the department defines the following stages of control: current control (control of mastering the topic) and final control (credit).

Current control determines the degree of achievement by applicants of higher education of the planned results of the study of the relevant topic in the discipline «Fundamentals of Embryology» and is carried out at each practical lesson during the semester.

The final semester control (credit) determines the degree to which higher education applicants have achieved the planned learning outcomes determined by the work program of the academic discipline, and is carried out at the last practical session of the semester as a check of the level of knowledge formation and skills acquired in the process of studying the educational discipline «Fundamentals of Embryology».

Examples of test tasks for current control in the discipline "Fundamentals of Embryology"

1. While examining the amniotic fluid collected with the help of amniocentesis (puncture of amniotic membrane) cells with sex chromatin containing nuclei (Barr's bodies) were detected. What does this fact indicate?

a. Development of a female fetus

b. Development of a male fetus

c. Genetic disorders in embryonic development

d. Trisomy

e. Polyploidy

2. Blue asphyxia of a newborn child has been diagnosed. What vessel carrying oxygenated maternal blood to the fetus has been pinched during delivery?

a. Chorionic artery

b. Umbilical artery

c. Chorionic vein

d. Umbilical vein

e. Uterine artery

3. Two sacs contacting with each other (amniotic and yolk) can be seen in a 10-day embryo specimen. What is the structure in the place of their contact called?

a. Amniotic crus

b. Bottom of the amniotic sac

c. Roof of the yolk sac

d. Embryonic plate

e. Extraembryonic mesoderm

4. In a histological specimen is observed an extraembryonic organ that represents a bladder connected with intestinal tube. Its wall is covered with epithelium on the inside, on the outside it is formed of embryonic connective tissue. At early stages of embryogenesis, it functions as a hematopoietic organ. What organ is this?

a. Amnion

b. Allantois

c. Yolk sac

d. Umbilical cord

e. Uterine artery

5. At early stages of human embryogenesis there arises a digitiform outgrowth of the ventral wall of the primitive gut rooting itself in the amniotic crus. What is the name of this extraembryonic organ?

a. Yolk sac

b. Allantois

c. Amnion

d. Placenta

e. Umbilical cord

6. In the histological specimen of a human fetus there can be seen one of extraembryonic organs – a bladder linked with intestinal tube. In its wall there are primary germ cells and primary erythrocytes (megaloblasts). Define what this organ is.

a. Yolk sac

b. Allantois

c. Placenta

d. Umbilical cord

e. Amnion

7. In the course of the experiment a frog embryo the external embryonic layer – ectoderm – has been destroyed. Which of the following morphological structures has not developed henceforth?

a. Epidermis

b. Somites- mesoderm

c. Nephrotome – intermediate mesoderm

d. Splanchnotome – lateral plate mesoderm

e. Myotome - somite

8. In a histological specimen there is a hen embryo in the stage of mesoderm differentiation to somites, nephrotomes, and splanchnotome. Of which material will the axial skeleton develop?

a. Myotome – muscle: trunk and limb

b. Dermatome - dermis

c. Nephrotomee – the kidney

d. Splanchnotome – nephrotome and gonadotome

e. Sclerotome – vertebra and ribs

9. Zygote cell-division finishes after blastula formation. What type of blastula is specific of a human being?

a. Discoblastula.

b. Celoblastula.

c. Blastocyst.

d. Amphiblastula.

e. Morula.

10. During the third week of embryo-genesis the central part of epiblast cells (ectoderm) sags and neurulation process begins. In which direction will the remaining ectodermal cells differentiate?

a. Gut

b. Skin

c. Somites – myo ; dermo ; sclero

d. Choroid

e. Yolk sac

11. In a microscopic specimen of a human embryo, taken after involuntary miscarriage, an embryonic plate has been detected with two cellular layers: endo- and ectoderm. At what stage of embryonal development is this embryo?

A. Gastrulation.

B. Progenesis.

C. Neurulation.

D. Histogenesis.

E. Organogenesis

12. During the process of a human embryo formation one can observe the rise of a cavity, light little blastomeres at the periphery, and dark big blastomeres at one of the poles. How is the embryo called at this stage of development?

a. Blastocyst

b. Morula

c. Zygote

d. Gastrula

e. Embryonic disk

13. Gonoblasts, sex stem cells, are detected in a 2-3-week-old embryo. Where do these cells differentiate?

a. In embryonic endoderm

b. In mesenchyme

c. In embryonic ectoderm

d. In dermatome

e. In yolk sac

14. Embryonic implantation into endometrium (uterine mucosa) consists of two phases – adhesion and invasion. The first phase is accompanied by:

a. Activation of uterine glands secretion

b. Destruction of endometrium connective tissue

c. Destruction of endometrium epithelial cells

d. Blastocyst attachment to endometrium surface

e. Suppression of uterine glands secretion

15. Where does the blastocyst normally implant?

a. Functional layer of the cervix

b. Functional layer of the endometrium

c. Basal layer of the endometrium

d. Myometrium

e. Perimetrium

SCORING SCHEME

Current control of educational activities of the applicant for higher education

Current control is carried out at each practical lesson as a check of the level of formation:

- knowledge of the theoretical content of the topic being studied (test form of control, 50% of the total score),

- compulsory skills and abilities (interview to determine the level of practical skills, 50% of the total assessment).

Control of mastering the topic. Written testing on the topic is conducted in every class. The test task for the current control consists of 15 tests of the closed type and necessarily contains the questions from the base of the state licensing examination KROK-1. The time required to complete the test task is 1 minute per question (15 minutes).

According to the test results an interview is conducted.

Grades of the current academic performance of higher education students are calculated according to the traditional (four-point) scale.

The grade "5" (excellent) is given to a student, who:

1. Completed homework (answered the questions in the Workbook concerning the topic).

2. During the testing, correctly answered 14-15 questions from 15.

3. Finished the practical class record (drawn specimens and diagrams in the Workbook to the topic).

4. Correctly answered 95-100% of the teacher's questions, using specimens and electron micrographs which are discussed at the practical class.

5. Demonstrated a high level of practical skills.

The grade "4" (good) is given to a student, who:

1. Completed homework (answered the questions in the Workbook concerning the topic).

2. During the testing, correctly answered 12-13 questions from 15.

3. Finished the practical class record (drawn specimens and diagrams in the Workbook on the topic).

4. Correctly answered 80-90% of the teacher's questions, using specimens and electron micrographs which are discussed at the practical class.

5. Demonstrated a sufficient level of practical skills.

The grade "3" (satisfactory) is given to a student, who:

1. Completed homework (answered the questions in the Workbook concerning the topic).

2. During the testing, correctly answered 10-11 questions from 15.

3. Finished the practical class record (drawn specimens and diagrams in the Workbook on the topic).

4. Correctly answered 70-80% of the teacher's questions, using specimens and electron micrographs which are discussed at the practical class.

5. Demonstrated a satisfactory level of practical skills.

The grade "2" (unsatisfactory) is given to a student, who:

1. Did NOT do his homework (did NOT answer the questions in the Workbook concerning the topic).

2. During the test correctly answered LESS, than 10 questions from 15

3. Did NOT finish the record of the practical class (did NOT draw specimens and diagrams in the Workbook on the topic).

4. Did NOT answer more than 70% of the teacher's questions.

5. Demonstrated a low level of practical skills.

The final control is carried out at the last practical lesson in the semester as a check of the level of formation:

- knowledge of the theoretical content of the discipline «Fundamentals of Embryology» (test form of control, 50% of the total score),

- compulsor skills and abilities (interview interview with determination of the level of practical skills, 50% of the total assessment).

The testing task for the final control consists of 45 tests of the closed type and necessarily contains questions from the base of the state licensing examination KROK-1. The time required to complete the test task is 1 minute per 1 question (45 minutes).

After the test, the applicant of higher education passes an interview and demonstrates practical skills.

List of questions for the credit in the discipline "Fundamentals of Embryology"

1. Subject and tasks of Medical Embryology.

2. Correlation of ontogeny and phylogeny. Periodization of human embryogenesis.

3. Structure of the female reproductive systems.

4. Meiosis as a mechanism of germ cell formation.

5. Structure of the female sex cells. Gametogenesis.

6. Oogenesis.

7. Structure of the male reproductive systems.

8. Structure of the male sex cells.

9. Spermatogenesis.

10. Fertilization.

11. Cleavage.

12. Morula. Blastocyst formation.

13. Embryo and trophoblast.

14. Implantation.

15. Biological processes underlying the development of the embryo.

16. Delamination. Structures formed as a result of delamination.

17. Gastrulation. Formation of Germ Layers.

18. Fetal Membranes.

19. The Placenta.

20. Multifetal pregnancies.

21. Modern reproductive technologies.

ASSESSMENT CRITERIA

The evaluation of the final control of the educational activity of the students of higher education is determined according to the traditional (four-point) scale.

Grade "5" (excellent):

Correct answers to 43 - 45 questions from 45 of the final test tasks

Correct answers to 95-100% of questions and demonstration of practical skills during the interview.

Grade "4" (good):

Correct answers to 38 - 42 questions from 45 of the final test tasks

Correct answers to 85-90% of questions and demonstration of practical skills during the interview.

Grade "3" (satisfactory):

Correct answers to 32 - 37 questions from 45 of the final test tasks

Correct answers to 70-80% of questions and demonstration of practical skills during the interview.

Grade "2" (unsatisfactory):

Correct answers less than 32 questions from 45 of the final test tasks

Correct answers are less than 70% of the questions and lack of practical skills during the interview.

Control of practical skills is implemented on the basis of the assessment of the ability to analyze microphotographs of histological preparations, electronic microphotographs and other illustrations that reflect the structure of the human body at the stages of intrauterine development.

To get the test (assessment for the semester), the applicant of higher education must work out all the missed classes (lectures and practical ones) and score at least 120 points for educational activities.

The counting of points received during the study of the discipline «Fundamentals of Embryology»is carried out by the teacher at the last practical training of semester.

The number of points for the academic discipline «Fundamentals of Embryology» is calculated as the average arithmetic assessment of the traditional four-point scale with rounding up to two decimal places, followed by conversion to a 200-point scale.

According to the number of points scored, the grade for the discipline «Fundamentals of Embryology» (passed / failed) is determined by the two-level scale of the university, given below.

Evaluation scale

(According to the number of received points on the university scales assigned in accordance with such system):

Received points	Two-level evaluation scale
0-119	Not credited (failed)
120-149	Credited (graded)
150-179	
180-200	

RECOMMENDED LITERATURE

Basic literature

1. Keith L. Moore, T.V.N. Persaud, Mark G. Torchia, The Developing Human: Clinically Oriented Embryology, 10th Edition, 2015.

2. Netter's atlas of human embryology/ Larry R. Cochard. - Updated Edition, 2012.

Additional literature

1. Ross, Michael H. Histology : a text and atlas : with correlated cell and molecular biology / Michael H. Ross, Wojciech Pawlina. - Seventh edition. Copyright © 2016 Wolters Kluwer Health, 984 p.

2. Mescher A.L. : Junqueira's Basic Histology: Text and Atlas, 15th ed. 2018.

3. Standring S, editor. Gray's Anatomy: The anatomical basis of clinical practice; 41st Ed. Elsevier; 2015.

LINKS TO THE INTERNET INFORMATION RESOURCES, VIDEO LECTURES, AND OTHER METHODOLOGICAL SUPPORT

1. Training materials of distance-learning courses «General Embryology», "Histology, cytology and embryology", "Histology, cytology and

embryology_2","Special histology" [Electronic resource]. - Access mode: (https://moodle.karazin.ua).

2. Histology Guide / T. Clark Breje, Robert L. Sorenson. 2005-2019. http://www.histologyguide.com

3. 3D-atlas of Human Embryology. [Electronic resource]. - Access mode: https://www.3dembryoatlas.com

4. Normative documents regulating the educational process (Web-site of the medical faculty of V.N. Karazin KhNU, section "For students"). [Electronic resource]. - Access mode: http://medicine.karazin.ua/

ONLINE STUDYING

Preparation for classes. Preparation for classes is carried out by students independently on the basis of textbooks of Histology, cytology and embryology, Lectures (video lectures), Krok-1 questions book and training videos.

Classes. The classes and knowledge monitoring are carried out by your teacher in the Google Meet video chat according to your official Timetable (see The rules of conduct for online Classes, Credit and Final Exam below).

Rework of the classes. You have to rework your classes to your teacher in the Google Meet video chat according to the Rework Timetable (every teacher has his/her own Timetable of reworks, so they will announce it to you separately).

Academic honesty. Students found cheating in any form, will receive an automatic failing grade for the course and their names will be sent to the Dean of the Medical School for further disciplinary action.

Communication with teachers. For communication with teachers, email or a convenient messenger can be used by agreement.

RULES OF ONLINE CONDUCT

General rules:

1. The class, module and final exam will be video recorded.

2. The student taking a video proctored online class, module and final exam must prove their identity prior to the examination by showing their ID card, passport and credit book.

3. The student is obliged to show their room by making a 360° film of the room with the webcam.

4. The student must be dressed and behave decently at all times.

5. The student's room must be quiet and tranquil. There may not be sounds from music, television or any other sounds.

6. The webcam and microphone required for the class, module and final exam must be enabled and running.

7. The webcam must be focused on the student taking the class, module and final exam at all times.

8. The student's face must be positioned in the center of the webcam view and must be visible throughout the duration of the class, module and final exam.

9. Nothing may cover the lens of the webcam at any time during the class, module and final exam.

10. The student must face the webcam during the class, module and final exam constantly.

11. Wearing ear plugs or headphones is not allowed.

12. There may not be any other people in the student's room.

13. There may not be other computers or similar devices running in the student's room.

14. Lighting must be "daylight" quality and overhead. If overhead lighting is not possible, the source of light should not be behind the student.

15. On the desk or other workplace, there may not be anything except a computer/tablet/cell phone and, in case the computer/tablet/cell phone does not

have an internal webcam, an external web camera. All other materials have to be removed, unless explicitly permitted (ID card, passport and credit book).

Credit and Final Exam rules:

16. The teacher doesn't have to interpret given questions for the student as class, module and final exam questions require the student to make his/ her own interpretations or assumptions.

17. The question review is not allowed, providing no opportunity to change student answers.

18. The student doesn't have to receive assistance from the teacher, or anyone else, during the class, module and final exam.

19. The student doesn't have to repeat questions of the teacher out loud.

20. The student cannot access any resources during the class, module and final exam. This means no resources of any kind are allowed, including external websites, other software applications, or any other hardcopy resources. All other web browser tabs must be closed during the class, module and final exam. Cell phones and all other electronic devices must be turned off for the class, module and final exam.

21. The student may not leave the room after starting the class, module and final exam. Everything must be completed in one sitting. Restroom or other breaks aren't allowed.

22. The class, module and final exam has a specific amount of time allotted (max 15 minutes for each student) and a specific number of questions (2 questions for class and 3 questions for module and final exam).

23. Questions must be answered orally. No keyboard is required and typing is not allowed.

24. The student has to answer the teacher's questions immediately without any hesitation.

Cheating:

25. Cheating is a serious offence and subject to disciplinary action under Code of Ethics. Any evidence of cheating that occurs during the class, module and final exam would be noted in detail by the teacher. The teacher, who becomes aware that the student may have cheated or have failed to follow the rules in any way, is obligated to notify the Head of Department and Dean Office.

Examples of the cheating are:

 Any recording of the screens, including taking screenshots, pictures, or video.

 Copying the questions or answers.

 Leaving mobile devices/smart phones, other web browsers, software applications, or other computers on during the class, module and final exam.

 Having access to or consulting notes or books during the class, module and final exam.

 Allowing other individuals to be present, to come in and out of the room during the class, module and final exam.

 Talking or otherwise communicating with another person during the class, module and final exam.

 Arranging to have another person take a class, module and final exam for the student.

Breaking the class, credit and final exam rules:

26. If the student breaks the Rules, the student can be excluded from participating or continuing the class, module and final exam. The teacher may also decide to nullify, not assess and/or not establish a result for the (partially) completed class, module and final exam.

Електронне навчальне видання комбінованого використання
Можна використовувати в локальному та мережному режимі

Проценко Олена Сергіївна
Чумак Любов Ігорівна

ОСНОВИ ЕМБРІОЛОГІЇ

Методичні рекомендації
для студентів І курсу медичного факультету

В авторській редакції

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