[Medicinski fakultet u Rijeci]

Curriculum
2021/2022

[Za kolegij]

Histology and Embryology

Study program:	**Medical Studies in English (R)** [Sveučilišni integrirani prijediplomski i diplomski studij]
Department:	**[Zavod za histologiju i embriologiju]**
Course coordinator:	**izv. prof. dr. sc. Wensveen Felix, dipl. biolog**
Year of study:	**2**
ECTS:	**10**
Incentive ECTS:	**0 (0.00%)**
Foreign language:	**Possibility of teaching in a foreign language**

Course information:

Histology and Embryology is a mandatory course at the second year of the Integrated Undergraduate and Graduate University Study of Medicine in English. It consists of 32 hours of lectures, 44 hours of seminars, and 44 hours of practical laboratory classes; overall 120 hours (10 ECTS). Lectures are held in lecture halls of the Faculty of Medicine according to the course schedule. Seminars and practical laboratory classes are held at the Department of Histology and Embryology.

Course objectives

Histology, a fundamental field of medicine, focuses on the microscopic structure of the human body. It examines cell morphology (cytology) and the fine details of organs (microscopic anatomy). Histology encompasses the entire sub-microscopic structure of organisms. In parallel, embryology explores embryo development, emphasizing morphogenesis during organogenesis and the molecular basis of differentiation. Understanding these complexities is essential for clinicians to grasp micro-anatomical pathophysiology and anomalies in organ development. This course holds significant practical value. Lastly, it delves into the relationship between congenital malformations and embryological errors.

Expected course learning outcomes

At the end of this course, students will be able to demonstrate a working knowledge of human histology and development and will be able to correlate structure and function of the human body. Students should be able to comprehend the molecular, biochemical, and cellular events that regulate the development of specialized cells, tissues and organs during embryonic development. Students should be able to comprehend tissue interactions and pattern formation. Moreover, students should understand the experimental strategies and techniques that are used to identify the molecular and cellular mechanisms of development.
Students should be thoroughly acquainted with structures and development of the human body by means of classical and contemporary methods of microscopic investigations; they should master the skills of microscopy of the most characteristic cells, tissues, and organs presented in histological slides. By utilizing their knowledge in physics, chemistry, biochemistry, biology, and anatomy, students should gain insight into the normal structure of the human body by means of light and electron microscopy.

Course content

The primary role of **histology** in the medical curriculum is to provide a basic understanding of the function of the human body based on its microscopical structure. Emphasis is placed on the normal structure as a basis for proper functioning and for understanding pathophysiological processes. The following topics and subtopics will be considered: epithelial tissues (cellular membrane, basal lamina, cell-cell interactions); connective tissue (general characteristics, cells and intercellular substance, fibers, and ground substance); types of connective tissue (proper - dense, regular and irregular, adipose tissue); cartilage (hyaline elastic, fibrocartilage); bone (microscopic structure of bones, bone cells, histogenesis of bone, synovial membrane), blood, lymphocytes and their immune role; muscular tissue (smooth, skeletal, cardiac muscle), nervous tissue (structure of neuron, nerve fiber, synapse and the relationship of neurons, neuroglia, choroid plexus); blood vascular system, lymphatic system, endocrine system, respiratory system, gastrointestinal tract, kidney and urinary tract, reproductive system and the organs of special senses.

The purpose of **embryology** is to provide students with a general outline of human development and to help them understand the complex relationships between the structures of the human body. Its practical medical implications are also of great importance since embryology can explain developmental anomalies and their molecular origins. The following topics and subtopics will be covered: fertilization, cleavage, gastrulation and formation of primary germ layers; differentiation of primary germ layers and organogenesis; cellular and molecular mechanisms that control tissue morphogenesis and differentiation; mechanisms that control differential gene expression leading to cell and tissue differentiation; extraembryonic coelom, connecting stalk, amnion, corium, placenta; neural plate, groove and tube; sex cycles, male and female sex organs; embryonic and fetal development; relationships between congenital malformations and errors in embryological development; environmental factors as causes of birth defects; development and anomalies of body systems; prenatal diagnostics.

List of assigned reading:

1. A.L. Mescher.: Junqueira's Basic Histology, XIV edition, The McGraw –Hill Education, New York 2016.
2. T.W.Sadler: Langman's Medical Embryology, XIII edition, Wolters Kluwer Health, Philadelphia,2015.
3. http://medsci.indiana.edu/junqueira/virtual/junqueira.htm
4. https://accessmedicine.mhmedical.com/book.aspx?bookid=2430

List of optional reading:

http://www.histologyguide.com/

Curriculum:

Student obligations:

Class attendance, including test attendance, is mandatory. Students may be absent from 30% of each form of teaching provided they have a justifiable cause. If a student is absent for more than 30% of the classes, they will have to re-enroll the course. Students are expected to actively participate in all aspects of the course, complete laboratory reports on time, and attend the examinations. Moreover, preparation of the course content, which is going to be discussed during seminars and laboratory practicals, is mandatory.

Exam (exam taking, description of the written/oral/practical part of the exam, point distribution, grading criteria):

Student grading will be conducted according to the current Ordinance on Studies of the University of Rijeka (approved by the Senate) and the Ordinance on Student Grading at the Faculty of Medicine in Rijeka (approved by the Faculty Council).

Assessment of student work

Student grading will be conducted according to the current Ordinance on Studies of the University of Rijeka (approved by the Senate) and the Ordinance on Student Grading at the Faculty of Medicine in Rijeka (approved by the Faculty Council).

Assessment of student work

Student work will be assessed and graded during the course and on the final exam. During the course, students may obtain a total of 100 grade points (credits). Students can achieve up to 70% of the final grade during the classes, and a maximum of 30% of the final grade at the final exam. Evaluation of students' progress during classes, midterms, and the final exam in the academic year 2024/2025 is shown in Table 1.

Table 1. Distribution of grade points in the course "Histology and Embryology"

	Evaluation	Grade points	
Midterm exams	Midterm exam I	24	
	Midterm exam II	20	
	Total	**44**	
Seminars, Laboratory practicals	Active participation (max. 8 points) Completed LPs and an accepted written report (max. 3 points)	11	
Tissue section recognition	Recognition of Slides exam	15	
TOTAL		**70**	
	Oral exam	30	
	Total	**30**	
TOTAL		**100**	

Written midterm exams

During the semester, two written midterm exams are planned that will include the content of lectures, seminars, and practical laboratory classes. MT I – general histology and basic embryology. MT II – histology and development of various organs. The maximum of grade points that a student can obtain is 24 (MT I) and 20 (MT II). The midterm exams consist of 60 multiple-choice questions and are evaluated according to the criteria

Table 2. Evaluation of written midterm exams

	MT I	MT II
No. of correctly answered questions	**Grade points/credits**	**Grade points/credits**
55 - 60	24	20
50 - 54	22	18
46 - 49	20	16
42 - 45	18	14
38 - 41	16	12
34 - 37	14	10
30 - 33	12	8
26 - 29	6	4
0 – 24	0	0

Correction of the midterm exams

A student can retake each of the two midterm exams if they are not satisfied with the obtained credits or were absent at the midterm exam. If a student retakes the midterm exam because they are not satisfied with the obtained grade points, only the credits gained from the retaken midterms will be considered. Evaluation of the midterm corrections will be performed according to the criteria shown in Table 2. Students can retake each midterm exam only once. Correction of the midterm exams will be done before the final exams in February on a date that will be communicated by the course coordinator via Merlin.

Seminars and practical laboratory classes (LPs)

A student can obtain a maximum of 11 credits (Table 3) throughout seminars and practical laboratory classes. Evaluation of LPs implies a completed and accepted written report with drawings of all slides. During LPs and seminars, the oral examination can be performed by the teacher or through short written exams. If the theoretical knowledge of a student during a seminar is considered insufficient, the teacher has the right to give a grade of 1 (F) for that seminar. **The student is subsequently not allowed to participate in the next midterm exam.** However, before the midterm exam is held, the student is allowed to request a brief oral exam on the topic for which he/she received a 1 (F) by one of the staff members of the dept. of histology and embryology. If his/her knowledge is considered sufficient, the grade for this seminar will be increased from 1 (F) to 2 (D), which allows participation to the midterm exam. An oral examination for a seminar can only be requested if a grade of 1 (F) is given. An oral exam should be requested by first registering with the secretary of the dept. of histology & embryology, by sending an email to Lidija.karinja@medri.uniri.hr or to the course coordinator. Subsequently, the student and teacher will agree on a date and time for the oral examination.

Table 3. Evaluation of seminars and practical laboratory classes

Points for class participation (Max. 8) will be based on the average grade obtained during the seminars and LPs. If a student did not get at least three grades during the seminars and LPs, participation is considered insufficient and no grade points will be awarded.

Final topics evaluation	Grade points/credits

2,00 – 2,51	3
2,51 – 3,00	4
3,01 – 3,50	5
3,51 – 4,00	6
4,01 – 4,50	7
4,51 – 5,00	8

Points for the completed written report (Lab book) of the LPs (max. 3 points) will be based on the proper graphical representation of the various tissues and marking of the key features of each tissue.

Recognition of Slides (ROS) exam

Is a mandatory oral exam and is required for students to be qualified for the final exam. Before going to this colloquium, the student must have completed all the LPs. If he/she was absent from one or more LPs, these need to be done in the time provided for making up the exercises (i.e. LP21 and LP22). A student must identify at least 8 of the 10 microscopic slides, as well as the structures that are described (and drawn) during the practical laboratory classes. For this ROS-examination a student can receive a maximum of 15 points. At least 8 points are required to pass the exam. Each slide is evaluated with ½, 1, or 1 ½ points depending on the student's knowledge. Recognition of the slides awards ½ point and answering additional questions adds up to 1 point for each slide. This ROS-exam will be held in the weeks before each final exam. Per exam period, a student can apply twice for an ROS-exam, with at least three days between each examination. Precise dates and hours will be communicated digitally.

Final exam

The final oral exam is mandatory and covers the entire course content. During the final exam, students can obtain a maximum of 30 credits.

Assessment of the oral part of the final exam:

up to 15 credits: minimum criteria satisfied

16 – 20 credits: average criteria satisfied with noticeable errors

21 – 25 credits: answers with a few errors

26 – 30 credits: outstanding answers.

A student must pass the oral exam (i.e. receive at least 1 point) to pass the course, independent of the number of points that the student has collected before taking the final exam. If a student is not satisfied with the final grade, they may refuse the grade, but this will count as a failed attempt. In case a student does not accept the grade, he/she must re-enter the final exam.

Conditions for admission to the final exam

A student who has accomplished at least 35 grade points during all course classes and has passed the ROS exam and has attended at least 70% of lectures, seminars and LPs (70% of each) can enter the final exam.

Final grade

The final grade represents a sum of all grade points obtained during all course classes and the final exam. Students are evaluated according to the ECTS (A-F) and numerical (5-1) system.

The ECTS and the numerical grading system are defined by the following criteria:

B (4) 75,0 – 89,9 credits

C (3) 60,0 – 74,9 credits

D (2) 50,0 – 59,9 credits

F (1) 0 – 49,9 credits

Exempt of lectures

A student who fulfilled all requirements for admission to the final exam but did not successfully complete the final exam may request that he/she does not need to attend lectures/seminars/LPs in the following year, while retaining the right to apply for the final exam. This request needs to be sent by email before the start of the next academic year to the course coordinator. Should the student instead decide to follow lectures anew, he/she loses all points of the previous year.

Exam dates

- 11.02.2025
- 25.02.2025
- 09.07.2025
- 03.09.2025
- 17.09.2025

Other notes (related to the course) important for students:

Class attendance, including test attendance, is mandatory. Students may be absent from 30% of each form of teaching provided they have a justifiable cause. If a student is absent for more than 30% of the classes, they will have to re-enroll the course. Students are expected to actively participate in all aspects of the course, complete laboratory reports on time, and attend the examinations. Moreover, preparation of the course content, which is going to be discussed during seminars and laboratory practicals, is obligatory.

Academic Honesty

It is expected that all students and teachers follow the Code of Academic Honesty in accordance with the Code of Ethics for the students of the Faculty of Medicine at the University of Rijeka. Please read the policy regarding academic honesty at: http://medical-studies-in-english.com/wp-content/uploads/2016/12/CODE-OF-ETHICS.pdf

Contact information

For questions and concerns, please feel free to contact us by e-mail or via the Department’s website. If you want to speak with a teacher during office hours (each working day between 11:00 am and 13:00 am), please let us know by e-mail or in class.

Expected competencies at course enrollment:

Students are expected to have basic knowledge of biology and anatomy.

COURSE HOURS 2021/2022

Histology and Embryology

List of lectures, seminars and practicals:

EXAM DATES (final exam):
