Faculty of Medicine in Rijeka

Curriculum
2026/2027

For course

Transfusion Medicine

Study program:	**Medical Studies in English (R)** University integrated undergraduate and graduate study
Department:	**Department of Clinical Laboratory Diagnostics**
Course coordinator:	**prof. prim. dr. sc. Balen Sanja, dr. med.**
Year of study:	**5**
ECTS:	**1.5**
Incentive ECTS:	**0 (0.00%)**
Foreign language:	**Possibility of teaching in a foreign language**

Course information:

The course Transfusion Medicine is a compulsory course on the fifth year of the Integrated Undergraduate and Graduate University Study of Medicine and consists of 20 hours of lectures and 5 hours of seminars, a total of 25 hours; 1.5 ECTS. Lectures and seminars are held in lecture halls of the Faculty of Medicine according to the course schedule.

Course objectives:

The aim of the course is to acquire basic knowledge in the field of transfusion medicine, a unique activity that combines science, biotechnology, medicine, laboratory diagnostics, public health and society as a whole, and as such is not the exclusive domain of transfusion medicine specialists, but other health professionals. who participate in transfusion treatment or use laboratory tests in making diagnoses, as well as all those involved in the promotion and organization of blood donation.

Course content:

General principles of blood donation; Type and characteristics of blood products and plasma derivatives, and indications for their use; Implementing optimal, rational and effective transfusion treatment; Systematic monitoring of transfusion treatment, Laboratory diagnostics in transfusion medicine, Quality control in laboratory diagnostics, Oral anticoagulant therapy.

Teaching:

Classes are held in the form of lectures and seminars. The estimated duration of classes is a total of once a week for 8 weeks. During the seminar, the teacher discusses the specifics of transfusion medicine with students. At the end of the class there will be a written test and an oral final exam. By completing all teaching activities and taking the written test and final exam, the student acquires 1,5 ECTS credits.

List of assigned reading:

Balen S. Fundamentals of transfusion medicine, Faculty of Medicine Osijek 2014, II edition.

List of optional reading:

Harmening DM. Modern Blood Banking & Transfusion Practice. F.A.Davis Company 2017, VII edition.

Curriculum:

Lectures list (with titles and explanation):

L 1. Introduction to the course and historical review

Get informed with the goal of the course Transfusion Medicine Get informed with the historical facts of the development of Transfusion Medicine: myths and legends, basic discoveries, organization of transfusion activity in the Republic of Croatia and in the world.

L 2. General principles of blood donation

Define the basic elements in selecting a blood donor (BD); Get informed with the procedure of receiving donors and taking blood; Laboratory testing of donor blood; Define specific categories of BD.

L 3. Production of blood products

Recognize changes in blood during production and storage, blood in vivo and in vitro; What can be obtained from blood- production of blood products and plasma derivatives. Define the characteristics and application of blood products and plasma derivatives.

L 4. Quality system in transfusion medicine

How to achieve a unique quality of blood products? Quality control, quality management elements. How to achieve safe, quality and effective transfusion treatment?

L 5-6. Erythrocyte blood groups: AB0, RhD

Get informed with the immunology of erythrocyte blood groups, inheritance and distribution, clinical significance: ABO and Rh blood group systems.

L 7. Other erythrocyte blood groups

To become familiar with other erythrocyte blood group systems and understand their clinical significance.

L 8-9. Blood-borne diseases

Learning outcomes: Define blood-borne diseases: laboratory diagnostics, window phenomenon, purpose of quarantine, lookback, trace-back procedure.

L 10-11. Transfusion treatment

How to manage transfusion treatment: indications and choice of blood products, making the right decision about transfusion treatment; risk assessment and effectiveness measurement.

L 12-13. Transfusion reactions

Understand the risks and side effects of transfusion treatment. Recognize early and late transfusion reactions in a timely manner and their effective treatment.

L 14. Systematic monitoring of transfusion therapy

How to manage serious adverse events: Collection and analysis of data on unexpected and adverse events from donor vein to recipient vein to take preventive and corrective measures to prevent their recurrence and improve the quality and safety of transfusion treatment.

L15. The importance of laboratory diagnostics in clinical transfusion practice

Laboratory testing of blood donor. Laboratory analysis in the examination of blood products. Pre-transfusion laboratory testing: which laboratory tests are used in the pre-transfusion test at the recipient and the importance of their application.

L16. Legislation in transfusion medicine

Introduction to the legal provisions that regulate the transfusion activity.

L 17.HLA system

To become familiar with the basics of the HLA system and understand its significance in clinical practice.

L 18. HLA System and Disease

To become familiar with the role of the HLA system in the pathogenesis of selected diseases, HLA-associated immune recognition, and disease susceptibility alleles.

L 19-20. Tissue Typing Methods

To become familiar with the laboratory methods used for HLA typing and understand their appropriate application in clinical practice.

Seminars list (with titles and explanation):

S.1. Voluntary blood donors

Plan how to ensure sufficient amounts of blood products: Motivation of donors, how to deal with blood shortages, models in the world.

S.2. Alternatives to transfusion treatment

Assess the possibility of applying alternative therapy, Artificial blood.

S.3. How to make the right decision about transfusion treatment?

Manage the specifics of transfusion treatment in different medical specialties.

S.4. Transfusion reactions

Classification of transfusion reactions, causes, diagnosis and therapy

S.5. Clinical Significance of HLA Alloimmunization

To become familiar with the mechanisms of HLA alloimmunization, methods of its prevention, and its significance in clinical practice.

Student obligations:

Students are required to attend regularly all forms of classes (on-line or on-site).

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 and the Ordinance on Student Grading at the Faculty of Medicine in Rijeka. Student assessment is performed using ECTS (A-F) and number system (1-5). Assessment in the ECTS system is performed by absolute distribution, and according to graduate assessment criteria.

I. Grades are not earned during classes (small course; 1.5 ECTS)

The student acquires grade points in the following way:

Class attendance is not specifically scored. A student may miss 30% of classes due to health reasons, which is justified by a medical certificate. If a student is unjustifiably absent from more than 30% of classes, he / she cannot continue following the course and loses the opportunity to take the final exam.

II. Final exam (total 100 points)

The final exam consists of a compulsory written and oral part. The written part of the exam carries up to 50 grade points. The oral exam carries 50 grade points.

a) Mandatory written test (up to 50 grade points)

The written test consists of 35 questions, and carries 50 grade points (the criteria for obtaining points is 50% of correctly solved questions).

a) Mandatory written test (up to 50 grade points)

The written test consists of 35 questions, and carries 50 grade points (the criteria for obtaining is 50% of correct answers).

Grade	Grade points	Correct answers
Insufficient	0	0-17
Sufficient	25-29	18-20
Good	30-36	21-25
Very good	37-44	26-33
excellent	45-50	34-35

b) Final oral exam (up to 50 grade points)

Students who have not taken the compulsory written test, as well as students who have not passed the exam threshold, ie have not passed more than 50% of the successfully passed test, do not have the right to take the oral exam (re-enroll in the second year).

To pass the final oral exam and the final grade (including the addition of previously achieved grade points on the mandatory test), the student must be positively graded and achieve a minimum of 50% of correct answers.

The ECTS grading system is defined by the following criteria:

A – 90 - 100% credits B – 75 - 89,9% C – 60 - 74,9% D -- 50 - 59,9% F – 0 - 49,9%

Grades in ECTS grading system are converted in numerical system by the following criteria:

A = excellent (5) B = very good (4) C = good (3) D = sufficient (2) F = insufficient (1)

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

Teaching contents and all information related to the course as well as exam dates can be found on the Merlin e-learning system and the web of the Faculty of Medicine, Department of Clinical Laboratory Diagnostics. The course schedule may change depending of the epidemiological situation and the current recommendations in Croatia.

COURSE HOURS 2026/2027

Transfusion Medicine

Lectures (Place and time or group)	**Seminars** (Place and time or group)
23.03.2027	

L 1. Introduction to the course and historical review:
• ONLINE (15:30 - 18:45) [147]
  ○ TM_399
 	
L 2. General principles of blood donation:
• ONLINE (15:30 - 18:45) [147]
  ○ TM_399
 	
L 3. Production of blood products:
• ONLINE (15:30 - 18:45) [147]
  ○ TM_399
 	
L 4. Quality system in transfusion medicine:
• ONLINE (15:30 - 18:45) [147]
  ○ TM_399	

prof. prim. dr. sc. Balen Sanja, dr. med. [147]	
06.04.2027	

L 5-6. Erythrocyte blood groups: AB0, RhD:
• ONLINE (15:30 - 18:45) [147]
  ○ TM_399
 	
L 7. Other erythrocyte blood groups:
• ONLINE (15:30 - 18:45) [147]
  ○ TM_399	

prof. prim. dr. sc. Balen Sanja, dr. med. [147]	
13.04.2027	

L 8-9. Blood-borne diseases:
• ONLINE (15:30 - 18:00) [147]
  ○ TM_399
 	
L 10-11. Transfusion treatment:
• ONLINE (15:30 - 18:00) [147]
  ○ TM_399	

prof. prim. dr. sc. Balen Sanja, dr. med. [147]	
20.04.2027	

L 12-13. Transfusion reactions:
• ONLINE (15:30 - 18:00) [147]
  ○ TM_399
 	
L 14. Systematic monitoring of transfusion therapy:
• ONLINE (15:30 - 18:00) [147]
  ○ TM_399	

prof. prim. dr. sc. Balen Sanja, dr. med. [147]	
27.04.2027	

L15. The importance of laboratory diagnostics in clinical transfusion practice:
• ONLINE (16:00 - 16:45) [147]
  ○ TM_399
	S.1. Voluntary blood donors:
	• ONLINE (17:00 - 18:15) [147]
	  ○ TM_399
	
	S.2. Alternatives to transfusion treatment:
	• ONLINE (17:00 - 18:15) [147]
	  ○ TM_399

prof. prim. dr. sc. Balen Sanja, dr. med. [147]	
04.05.2027	

L16. Legislation in transfusion medicine:
• ONLINE (15:30 - 16:15) [147]
  ○ TM_399
	S.3. How to make the right decision about transfusion treatment?:
	• ONLINE (16:30 - 18:00) [147]
	  ○ TM_399
	
	S.4. Transfusion reactions:
	• ONLINE (16:30 - 18:00) [147]
	  ○ TM_399

prof. prim. dr. sc. Balen Sanja, dr. med. [147]	
11.05.2027	

L 17.HLA system:
• ONLINE (15:30 - 18:00) [147]
  ○ TM_399
 	
L 18. HLA System and Disease:
• ONLINE (15:30 - 18:00) [147]
  ○ TM_399
 	
L 19-20. Tissue Typing Methods:
• ONLINE (15:30 - 18:00) [147]
  ○ TM_399
	S.5. Clinical Significance of HLA Alloimmunization:
	• ONLINE (18:15 - 19:00) [147]
	  ○ TM_399

prof. prim. dr. sc. Balen Sanja, dr. med. [147]	

List of lectures, seminars and practicals:

LECTURES (TOPIC)	Number of hours	Location
L 1. Introduction to the course and historical review	1	ONLINE
L 2. General principles of blood donation	1	ONLINE
L 3. Production of blood products	1	ONLINE
L 4. Quality system in transfusion medicine	1	ONLINE
L 5-6. Erythrocyte blood groups: AB0, RhD	2	ONLINE
L 7. Other erythrocyte blood groups	1	ONLINE
L 8-9. Blood-borne diseases	2	ONLINE
L 10-11. Transfusion treatment	2	ONLINE
L 12-13. Transfusion reactions	2	ONLINE
L 14. Systematic monitoring of transfusion therapy	1	ONLINE
L15. The importance of laboratory diagnostics in clinical transfusion practice	1	ONLINE
L16. Legislation in transfusion medicine	1	ONLINE
L 17.HLA system	1	ONLINE

L 18. HLA System and Disease	1	ONLINE
L 19-20. Tissue Typing Methods	2	ONLINE

SEMINARS (TOPIC)	Number of hours	Location
S.1. Voluntary blood donors	1	ONLINE
S.2. Alternatives to transfusion treatment	1	ONLINE
S.3. How to make the right decision about transfusion treatment?	1	ONLINE
S.4. Transfusion reactions	1	ONLINE
S.5. Clinical Significance of HLA Alloimmunization	1	ONLINE

EXAM DATES (final exam):

1.	01.06.2027.
2.	06.07.2027.
3.	07.09.2027.