

**DESCRIPTION OF COURSE UNIT FOR DOCTORAL STUDIES  
AT VILNIUS UNIVERSITY**

<b>Scientific Area/eas, Field/ds of Science</b>	Medical and Health Sciences (M 000): Medicine (M 001)			
<b>Faculty, Institute, Department/Clinic</b>	Medical Faculty Institute of Clinical Medicine Clinic of Emergency Medicine			
<b>Course unit title</b> (ECTS credits, hours)	<b>Emergency Medicine</b> 8 credits (212 hours)			
<b>Study method</b>	<b>Lectures</b>	<b>Seminars</b>	<b>Consultations</b>	<b>Self-study</b>
Number of ECTS credits	1	1	2	4
<b>Method of the assessment</b> (in 10 point system)	<p>Presentation and evaluation of the report: the report is presented on a target topic, which is coordinated with the coordinating lecturers (the doctoral student must analyze, review and present the latest scientific publications related to the respective topic).</p> <p>Criteria for evaluating the report (minimum readable score - 5):</p> <p>(a) the relevance, novelty and relevance of the material submitted topics (2 points);</p> <p>(b) the general structure and scope of the notification, a clear presentation of the knowledge, argumentation, conciseness and specificity (2 points);</p> <p>(c) Summary, presentation and justification of conclusions (1 point);</p> <p>d) raising problematic issues, reviewing the application of knowledge in one's own presentation in the dissertation (3 points);</p> <p>(e) organization of visual aids, ability to take part in discussions, question management, oratory skills (2 points).</p>			
<b>PURPOSE OF THE COURSE UNIT</b>				
<p><b>Course objectives - To introduce:</b></p> <ul style="list-style-type: none"> <li>- with the principles of emergency care, methods of diagnosis, and treatment;</li> <li>- with the protocols of the cardiology, neurology, and trauma cluster activity program for acute medical care;</li> <li>- to get acquainted with the main life-threatening conditions, their diagnosis, and initial management;</li> <li>- to get acquainted with the principles of providing medical assistance during mass injuries;</li> <li>- get acquainted with the principles of providing medical care in case of injuries;</li> <li>- to evaluate modern world threats - terrorism, military, ethnic conflicts and to provide first aid during them.</li> </ul>				
<b>THE MAIN TOPICS OF COURSE UNIT</b>				
<p>Fundamentals of human anatomy, physiology, pathology, etiology of diseases, pathogenesis, symptomatology, diagnosis of symptoms, and syndromes. Basics of etiology and pathogenesis of acute diseases and life-threatening conditions, symptoms of acute life-threatening conditions, and their possible complications. Etiology of sudden death, diagnosis, primary and secondary prevention, and principles of initial resuscitation. Assessment of the main signs of life</p>				

(consciousness, breathing, heart activity). Sports and Arrhythmias: Recommendations for sports, exercise, and driving in a variety of conduction and rhythm disorders.

Supraventricular arrhythmias. Atrial fibrillation: epidemiology, etiology, mechanisms, classification, prognosis, treatment methods (cardioversion - electrical and medical, prevention of relapse, control of ventricular contraction rate, prevention of thromboembolic complications with anticoagulants). Atrial flutter (epidemiology, mechanism, classification, drug or interventional therapy, prevention of thromboembolic complications).

Ventricular tachyarrhythmias: classification by mechanism, ventricular tachycardia associated with structural heart disease, idiopathic ventricular tachycardia (classification by mechanism and action of drugs, methods of treatment), epidemiology, etiology, prognosis, and treatment. Genetic abnormalities of cardiomyocyte membrane channels: long QT syndrome (types, treatments), short QT syndrome, catecholaminergic ventricular tachycardia (ryanodine receptor, calsequestrin mutations), mutations. Arrhythmias in cardiomyopathies (hypertrophic, dilated, arrhythmogenic right ventricular). Mutations of myosin, desmoplakin, laminin, collagen, etc. Risk of ventricular tachycardia and sudden death. Differential diagnosis of supraventricular and ventricular tachycardias.

Brugada syndrome (diagnosis and treatment). Bradyarrhythmias, AV-blockades. Diagnosis and treatment of bradyarrhythmias, temporary electrical pacing of the heart. Electrolyte imbalance, diagnosis, and treatment.

Protection of the caregiver, recommendations for resuscitation techniques in the context of COVID-19 infection and other serious infections. What is therapeutic hypothermia, methods of hypothermia, possibilities of therapeutic hypothermia in Lithuania.

Resuscitation of the unconscious, drowners, hangers, choking, airway control, choking mechanism, resuscitation after shock, sunstroke, or electric injury. Life-threatening conditions due to acute diseases, drug poisoning, and narcotics.

Dangerous conditions - in case of injuries, frostbite, and burns. Anaphylactic shock and first aid during anaphylactic shock.

Defibrillation and features of defibrillators, principles of their operation, indications for defibrillation, initial resuscitation skills, guidelines of the European Resuscitation Council. What is polytrauma, first aid in case of trauma, immobilization of the affected area, the concept of the golden hour, eye trauma, and first aid in the case of eye trauma.

Coma, coma scale, coma score. Acute coronary syndromes. Myocardial infarction with ST-elevation, without ST elevation, principles of medical care. What are clusters and their benefits. First aid for ischemic and hemorrhagic stroke, stroke pathogenesis. The golden hour after a stroke. Convulsions, impaired consciousness, headache. Acute mental disorders, acute conditions, and their management. What is a septic condition and sepsis. Prescribing antibiotics - to determine the difference between short and long treatment course of antibiotics.

Emergency diagnosis and treatment of endocrinological diseases.

Acute heart failure, diagnosis, treatment. Pulmonary artery embolism, diagnosis, treatment. ECMO (extracorporeal membrane oxygenation) indications for treatment, indication for resuscitation. Diagnosis and treatment of the aortic aneurysm. Diagnosis and treatment of pericardial tamponade. Rapid ultrasound examination protocols.

Assessment of pain in triage. Describe the factors influencing pain perception and expression. To analyze validated and most commonly used pain assessment strategies in triage. To point out physiological and behavioral changes caused by pain and assessed in triage. To evaluate the severity of pain and to be able to

make a decision based on the information of pain. Be able to determine the severity of pain and describe what information it provides when making decisions. Triage of traumatological patients. Political Trauma Protocol. Military and accident triage system. Triage evaluation models.

Problems of medical law. Legislation governing the provision of emergency care, the triage of patients in emergency departments. Informed patient consents, completion of documentation, cooperation with the police, and forensic experts.

Patient survey. The importance of teamwork. Efficiency and quality of services provided.

Principles of military medicine, provision of medical assistance in the event of mass disasters and terrorism, and legislation governing the provision of medical assistance in the event of mass disasters.

What is organ donation, legal acts regulating organ donation in Lithuania. Can emergency aid contribute to the development of donations in Lithuania.

### RECOMMENDED LITERATURE SOURCES

1. 2019 ESC Guidelines on the diagnosis and management of acute pulmonary embolism. European Heart Journal 2019.
2. Tintinalli's Emergency Medicine: A Comprehensive Study Guide, Judith E. Tintinalli, O. John Ma, Donald M. Yealy, Garth D. Meckler, J. Stephan Stapczynski, David M. Cline, Stephen H. Thomas, 9th edition, ISBN: 1260019934, 2019.
3. European Resuscitation Council COVID-19 Guidelines, 2019.
4. Europos reanimacijos tarybos gaivinimo gairės 2021 m.
5. The ESC Textbook of Intensive and Acute Cardiovascular Care / Edited by M. Tubaro et al. 2nd ed. Oxford, 2015.
6. Rosen's Emergency Medicine: Concepts and Clinical Practice: Volume - 1&2, 9e 9th Edition. Ron Walls MD (Author), Robert Hockberger MD (Author), Marianne Gausche-Hill MD FACEP FAAP (Author), 2018.
7. Cardiology: practical aspects. Mekhman N. Mamedov, First edition, Moscow, 2021.
8. European Resuscitation Council and European Society of Intensive Care Medicine Guidelines 2021: Post-resuscitation care Jerry P. Nolan, Claudio Sandroni, Bernd W. Bottiger, Alain Cariou, Tobias Cronberg, Hans Friberg, Cornelia Genbrugge, Kirstie Haywood, Gisela Lilja, Veronique R.M. Moolaert, Nikolaos Nikolaou, Theresa Mariero Olasveengen, Markus B. Skrifvars, Fabio Taccone, Jasmeet Soar.
9. European Resuscitation Council Guidelines 2021: Ethics of resuscitation and end of life decisions Spyros D. Mentzelopoulos, Keith Couper, Patrick Van de Voorde, Patrick Druwe, Marieke Blom, Gavin D. Perkins, Ileana Lulic, Jana Djakow, Violetta Raffay, Gisela Lilja, Leo Bossaert.
10. 2021 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure Developed by the Task Force for the diagnosis and treatment of acute and chronic heart failure of the European Society of Cardiology (ESC) With the special contribution of the Heart Failure Association (HFA) of the ESC
11. European Resuscitation Council Guidelines 2021: Cardiac arrest in special circumstances Carsten Lott, Anatolij Truhlar, Annette Alfonzo, Alessandro Barelli, Violeta Gonzalez-Salvado, Jochen Hinkelbein, Jerry P. Nolan, Peter Paal, Gavin D. Perkins, Karl-Christian Thies, Joyce Yeung, David A. Zideman, Jasmeet Soar, the ERC Special Circumstances Writing Group Collaborators.
12. European Resuscitation Council Guidelines 2021: Executive summary Gavin D. Perkins, Jan-Thorsen Graessner, Federico Semeraro, Theresa Olasveengen, Jasmeet Soar, Carsten Lott, Patrick Van de Voorde, John Madarj, David Zideman, Spyridon Mentzelopoulos, Leo Bossaert, Robert Greif, Koen Monsieurs, Hildigunnur Svavarsdottir, Jerry P. Nolan, on behalf of the European Resuscitation Council Guideline Collaborators.
13. Adult Basic Life Support 2020 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment

Recommendations Theresa M. Olasveengen, Mary E. Mancini, Gavin D. Perkins, Suzanne Avis, Steven Brooks, Maaret Castre´n, Sung Phil Chung, Julie Considine, Keith Couper, Raffo Escalante, Tetsuo Hatanaka, Kevin K.C. Hung, Peter Kudenchuk, Swee Han Lim, Chika Nishiyama, Giuseppe Ristagno, Federico Semeraro, Christopher M. Smith, Michael A. Smyth, Christian Vaillancourt, Jerry P. Nolan, Mary Fran Hazinski, Peter T. Morley, On behalf of the Adult Basic Life Support Collaborators.

14. European Resuscitation Council Guidelines 2021: Epidemiology of cardiac arrest in Europe Jan-Thorsten Graessner, Johan Herlitz, Ingvild B.M. Tjelmeland, Jan Wnent, Siobhan Masterson, Gisela Lilja, Berthold Bein, Bernd W. Böttiger, Fernando Rosell-Ortiz, Jerry P Nolan, Leo Bossaert, Gavin D. Perkins.
15. 2021 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure. European Heart Journal (2021) doi:10.1093/eurheartj/ehab368
16. 2020 ESC Guidelines for the diagnosis and management of atrial fibrillation developed in collaboration with the European Association of Cardio-Thoracic Surgery (EACTS). European Heart Journal (2020) doi:10.1093/eurheartj/ehaa612

### **CONSULTING LECTURERS**

1. Coordinating lecturer: Pranas Šerpytis (Prof. Dr.).

2. Robertas Stasys Samalavičius (Prof. Dr.).

3. Ieva Jovaišienė (Assoc. Prof. Dr.).

### **APPROVED:**

By Council of Doctoral School of Medicine and Health Sciences at Vilnius University:  
29th of September 2022

Chairperson of the Board: Prof. Janina Tutkuvienė