

REQUIREMENTS

Semmelweis University, Faculty of Medicine Name(s) of the Institute(s) teaching the subject: Department of Physiology
Name of the subject: Medical Physiology I. Credits: 10 Total number of hours (semester): 154 lectures: 84 practices: 70 seminars: - Type of the course (mandatory/elective): mandatory
Academic year: 2019/2020 academic year, I. semester
Code of the course¹: AOKELT466_1A
Course director (tutor): Dr. László Hunyady Contact details: Semmelweis University, Department of Physiology; phone: +36-1-459-1500/60400 Position: Full Professor Date of habilitation and reference number: 1997.05.26.; reference number: 197
Aim of the subject and its place in the curriculum: The goal of Medical Physiology course is to give the students the understanding of the concepts and principles of medical physiology. The lectures provide the information base while the seminars and practices provide the student with an opportunity to assimilate and integrate the material. Appropriate clinical perspectives are presented throughout the course.
Location of the course (lecture hall, practice room, etc.): Semmelweis University; Department of Physiology; H-1094 Budapest, Tűzoltó u. 37-47.
Competencies gained upon the successful completion of the subject: Understanding of the human physiology which is foundation of medical practice.
Prerequisite(s) for admission to the subject: Anatomy, Cell, Histology and Embryology II, Medical Biochemistry, Molecular and Cell Biology I., Medical Biophysics II.
Minimum and maximum number of students registering for the course: Maximum 250 students based on the registration in the NEPTUN system. Student selection method in case of oversubscription: -
How to register for the course: Registration must be recorded through the NEPTUN system.

Detailed thematic of the course²:*Lectures*

1. Introduction, body fluids. Functions of cellular membranes, transport across membranes. Transepithelial transports.
2. Signal transduction: receptors, G proteins, second messengers. Cellular calcium metabolism, receptors of growth factors and cytokines. Membrane trafficking and vesicular transport.
3. Ion channels and resting membrane potential. Action potential. Physiology of nerve cells, synaptic transmission in the central nervous system.
4. Autonomic neurotransmitters and physiology of smooth muscle. Neuromuscular junction and physiology of skeletal muscle. Physiology of the heart I.: origin and spread of cardiac excitation.
5. Cardiac cycle. Regulation of cardiac output. Electrocardiography (ECG).
6. Physiology of blood circulation: introduction. Hemodynamics, systemic circulation. Microcirculation.
7. Venous circulation and lymph flow. Local control of circulation. Reflex control of circulation.
8. Circulation of blood in the brain and coronary circulation. Splanchnic circulation, circulation of skin and skeletal muscle.
9. Respiration: pulmonary ventilation. Gas exchange in the lungs. Pulmonary circulation, ventilation-perfusion relationship.
10. Gas transport, hypoxias. Regulation of respiration. Adaptation of cardiovascular and respiratory system.
11. Renal function: renal circulation, glomerular filtration. Tubular functions. Concentration, dilution.
12. Regulation of body fluids and osmotic concentration. Introduction to acid-base balance. Acid-base balance: role of lungs and kidneys.
13. General principles of regulation in the gastrointestinal tract. Motor functions of the gastrointestinal tract.
14. Secretory functions of the gastrointestinal tract. Digestion and absorption of food. Energy balance, quality and quantity requirement of food.

Practices

1. Blood cell counting, determination of hemoglobin concentration and hematocrit, measurement of erythrocyte sedimentation rate
2. Leukocyte differential count on peripheral blood smear
3. Typing of Blood Groups, Blood Coagulation Test
4. Measurement of transport rate on red blood cells. Hemolysis
5. Investigation of cardiac functions in situ
6. Blood pressure measurement in humans
7. Echocardiography
8. Computer simulation: Neuromuscular junction
9. Electromyography (EMG), nerve conduction velocity
10. Recording and analyzing the human ECG
11. Computer simulation: Skeletal and smooth muscle
12. Effects of vagal nerve stimulation on cardiac functions
13. Respiratory physiology calculations
14. Evaluation of acid-base parameters with the Siggaard-Andersen nomogram

Potential overlap(s) with other subjects: -**Special training activities required³: -**

Policy regarding the attendance and making up absences:

The lecture hours per week are 6; the practice hours per week are 5. The attendance of a minimum of 75% of practices is necessary for the end-term signature. No more than three absences from practices are allowed for any reason; otherwise the semester will not be credited. There are no extra practices and missed practices cannot be retaken. Absence from the exam must be certified at the Head of the Department or Course Director within 3 working days.

Means of assessing the students' progress during the semester⁴:

The knowledge of the students is tested in a written form on a weekly base. The written short tests cover the material of lectures of the previous week.

Requirement for acknowledging the semester (signature):

The attendance of a minimum of 75% of practices is necessary for the end-term signature. Students must write a lab report for each practice using the Practical Book. The Practical Book should be signed by the teacher not later than one week after the practice. Participation in the practices is compulsory. No more than three absences from practices are allowed for any reason; otherwise the semester will not be credited.

Type of the examination:

In the examination period the students have to give semi-final exam in the first semester.

Exam requirements⁵:

Requirements of the semi-final exam: material of the Medical Physiology I.

The semi-final exam is oral exam. The oral exam consists of two theoretical questions (I-II). The overall result of the oral exam is based on the two theoretical grades and the lab work grade but a failed (1) theoretical question results in an overall failed (1) final exam.

Lists of the theoretical questions are listed in the webpage in the Department of Physiology. The following rules will be enforced during the exams: electronic devices must be kept in the baggage; baggage and overcoats should be placed next to the wall of the lecture halls; any form of communication is disallowed; students not complying with these rules will be disqualified immediately.

Type and method of grading⁶:

The semi-final exam is oral exam. The exam starts at 8:45 by showing up in the selected exam place. Your exam place and examiners are announced in written form at 8:30 (attached to the front door of the corridor of the Physiology Practice Rooms). The students need to bring ID card and the laboratory report book to participate in the exam. The oral exam consists of two theoretical questions (I-II). Grouping of questions, the topics of the semifinal exam can be found in <http://semmelweis.hu/elettan/teaching/second-semester>.

I: 1 and 2 topics of the semifinal exam

II: 3, 4 and 5 topics of the semifinal exam

The overall result of the oral exam is based on the two theoretical grades but a failed (1) theoretical question results in an overall failed (1) exam. The mathematical average of two oral exam grades gives the grade of the semi-final exam:

Excellent (5): 4.51 - 5.00

Good (4): 3.51 - 4.50

Satisfactory (3): 2.51 - 3.50

Pass (2): 2.00 - 2.50

Fail (1): below 2.00 or in case of failed (1) theoretical question.

The following rules will be enforced during the exam: electronic devices must be kept in the baggage; baggage and overcoats should be placed next to the wall of the lecture halls or the practice rooms; any form of communication is disallowed; students not complying with these rules will be disqualified immediately.

Failing to certify absence cause registering “absence” = “nem jelent meg” in the NEPTUN system.

How to register for the exam:

Registration for the exam must be recorded through the NEPTUN system.

Opportunities to retake the exam:

Repetition of the exam is possible at least three days after the unsuccessful trial.

Literature, i.e. printed, electronic and online notes, textbooks, tutorials (URL for online material):**List of textbooks:**

Textbook: Koeppen-Bruce M- Stanton- Bruce A: Berne & Levy Physiology (7th edition). 2017.

ISBN: 9780323393942

Practice book: Practices in Medical Physiology (Edited by: Péter Enyedi and Levente Kiss). 2017.

ISBN: 9789633314159.

Signature of the tutor:**Signature(s) of the head(s) of the Institute(s):****Date:**

2019. 09. 16.

Credit Transfer Committee's opinion:

Comment of the Dean's Office:
Signature of the Dean:

¹ Dékáni Hivatal tölti ki, jóváhagyást követően.

² Az elméleti és gyakorlati oktatást órákra (hetekre) lebontva, sorszámozva külön-külön kell megadni, az előadók és a gyakorlati oktatók nevének feltüntetésével. Mellékletben nem csatolható!

³ Pl. terepgyakorlat, kórlapelemzés, felmérés készítése stb.

⁴ Pl. házi feladat, beszámoló, zárthelyi stb. témaköre és időpontja, pótlásuk és javításuk lehetősége.

⁵ Elméleti vizsga esetén kérjük a tételsor megadását, gyakorlati vizsga esetén a vizsgáztatás témakörét és módját.

⁶ Az elméleti és gyakorlati vizsga beszámításának módja. Az évközi számonkérések eredményeink beszámítási módja.

REQUIREMENTS

Semmelweis University, Faculty of Medicine Name(s) of the Institute(s) teaching the subject: Department of Physiology
Name of the subject: Medical Physiology II. Credits: 10 Total number of hours (semester): 147 lectures: 84 practices: 63 seminars: - Type of the course (mandatory/elective): mandatory
Academic year: 2019/2020 academic year, II. semester
Code of the course¹: AOKELT466_2A
Course director (tutor): Dr. László Hunyady Contact details: Semmelweis University, Department of Physiology; phone: +36-1-459-1500/60400 Position: Full Professor Date of habilitation and reference number: 1997.05.26.; reference number: 197
Aim of the subject and its place in the curriculum: The goal of Medical Physiology course is to give the students the understanding of the concepts and principles of medical physiology. The lectures provide the information base while the seminars and practices provide the student with an opportunity to assimilate and integrate the material. Appropriate clinical perspectives are presented throughout the course.
Location of the course (lecture hall, practice room, etc.): Semmelweis University; Department of Physiology; H-1094 Budapest, Tűzoltó u. 37-47.
Competencies gained upon the successful completion of the subject: Understanding of the human physiology which is foundation of medical practice.
Prerequisite(s) for admission to the subject: Medical Physiology I.
Minimum and maximum number of students registering for the course: Maximum 250 students based on the registration in the NEPTUN system. Student selection method in case of oversubscription: -
How to register for the course: Registration must be recorded through the NEPTUN system.

Detailed thematic of the course²:*Lectures*

1. Haematopoiesis. Haemostasis, overview of immune system. Principles of the innate immunity.
2. Humoral immunity. Cellular immunity. Regulation of immune response, blood groups
3. Endocrine regulations. The hypothalamo-adenohypophyseal system; growth hormone, somatomedins.
4. Function of the adrenal cortex. Function of the thyroid gland.
5. Hormonal regulation of intermediary metabolism.
6. Calcium metabolism, bone tissue, growth. Function of the reproductive system: endocrinology of the sexual differentiation and development.
7. Function of the reproductive system: male sexual function; female sexual function; endocrinology of pregnancy, parturition, and lactation.
8. Introduction to neurophysiology. Physiology of nerve & glia cells.
9. Sensory functions.
10. Physiology of hearing and equilibrium.
11. Physiology of vision.
12. Motor functions.
13. Integration of autonomic responses.
14. Electroencephalogram (EEG); sleep phenomena. Learning and memory. Regulation of behavioral mechanisms, motivation; emotion.

Practices

1. Studies on circulatory reactions of a virtual rat
2. Circulatory and respiratory reflexes in rabbit (Demonstration, Practice)
3. Smooth muscle of rabbit small intestine
4. Human pulmonary function tests - Spirometry
5. Measurement of cardiac output in rat
6. Pulse wave in human
7. Oral glucose tolerance test (OGTT)
8. Human pulmonary function tests - Body plethysmography
9. Electrooculography (EOG) and investigation of the vestibular system
10. Spiroergometry
11. Human visual physiology
12. Investigation of reflexes
13. Practice for lab exam.
14. Lab exam

Potential overlap(s) with other subjects: -**Special training activities required³: -****Policy regarding the attendance and making up absences:**

The lecture hours per week are 6; the practice hours per week are 4.5. The attendance of a minimum of 75% of practices is necessary for the end-term signature. No more than three absences from practices are allowed for any reason; otherwise the semester will not be credited. There are no extra practices and missed practices cannot be retaken. Absence from the exam must be certified at the Head of the Department or Course Director within 3 working days.

Means of assessing the students' progress during the semester⁴:

The knowledge of the students is tested in a written form on a weekly base. The written short tests cover the material of lectures of the previous week.

Requirement for acknowledging the semester (signature):

The attendance of a minimum of 75% of practices is necessary for the end-term signature. Students must write a lab report for each practice using the Practical Book. The Practical Book should be signed by the teacher not later than one week after the practice. Participation in the practices is compulsory. No more than three absences from practices are allowed for any reason; otherwise the semester will not be credited.

Type of the examination:

In the examination period the students have to give final exam in the second semester.

Exam requirements⁵:

Final exam: material of the Medical Physiology I. and Medical Physiology II.

Participation in the final exam requires the completed “Anatomy, Cell, Histology and Embryology III” course with a successful exam.

The final exam consists of practical, written and oral part. The practical part (lab exam) takes place in the last week of the second semester. Passing the lab exam is not a prerequisite to participate on the final exam, but failed lab exam is taken into account in grading the final exam as fail (1) partial grade. The written and oral part of the final exam is held on the same day. The oral part consists of two theoretical questions (I-II). Failed (1) theoretical question results in an overall failed (1) final exam. The mathematical average of three or four partial grades (written exam grade, two oral exam grades, and lab exam grade) gives the grade of the final exam.

Lists of the theoretical questions are listed in the webpage in the Department of Physiology. The following rules will be enforced during the exams: electronic devices must be kept in the baggage; baggage and overcoats should be placed next to the wall of the lecture halls; any form of communication is disallowed; students not complying with these rules will be disqualified immediately.

Type and method of grading⁶:

The final exam consists of a practical, a written and an oral part. The practical part (lab exam) takes place in the last week of the second semester. The topics of the lab exam can be found in <http://semmelweis.hu/elettan/teaching/second-semester/>. Passing the lab exam is not a prerequisite to participate on the final exam, but a failed lab exam is taken into account in grading the final exam as a failed (1) partial grade.

The final exam consists of a written and an oral part. The written and oral part of the final exam starts at 8:45 by showing up in the selected exam place. Your exam place and examiners are announced in written form at 8:30 (attached to the front door of the corridor of the Physiology Practice Rooms). The students need to bring ID card and the laboratory report book to participate in the exam. The written part consists of 30 questions and takes 45 minutes. Grading of the written part:

0-14 correct answers = 1

15-18 correct answers = 2

19-22 correct answers = 3

23-26 correct answers = 4

27-30 correct answers = 5

The oral exam starts at 9:45 and consists of two theoretical questions (I-II). Grouping of questions, the topics of the final exam can be found in http://semmelweis.hu/elettan/teaching/second-semester.

I: 1, 2, 3, 4 and 5 topics of the final exam

II: 6, 7 and 8 topics of the final exam

The overall grade of the final exam is the mean of three or four partial grades (written exam grade, two oral exam grades, and lab exam grade if applicable), but a failed (1) theoretical question results in an overall failed (1) exam.

Excellent (5): 4.51 - 5.00

Good (4): 3.51 - 4.50

Satisfactory (3): 2.51 - 3.50

Pass (2): 2.00 - 2.50

Fail (1): below 2.00 or in case of failed (1) theoretical question.

The following rules will be enforced during the exam: electronic devices must be kept in the baggage; baggage and overcoats should be placed next to the wall of the lecture halls or the practice rooms; any form of communication is disallowed; students not complying with these rules will be disqualified immediately.

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How to register for the exam:

Registration for the exam must be recorded through the NEPTUN system.

Opportunities to retake the exam:

Repetition of the exam is possible at least three days after the unsuccessful trial.

Literature, i.e. printed, electronic and online notes, textbooks, tutorials (URL for online material):

List of textbooks:

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Practice book: Practices in Medical Physiology (Edited by: Péter Enyedi and Levente Kiss). 2017. ISBN: 9789633314159.

Signature of the tutor:

Signature(s) of the head(s) of the Institute(s):

Date:

2019. 09. 26.

Credit Transfer Committee's opinion:

Comment of the Dean's Office:

Signature of the Dean:

¹ Dékáni Hivatal tölti ki, jóváhagyást követően.

² Az elméleti és gyakorlati oktatást órákra (hetekre) lebontva, sorszámozva külön-külön kell megadni, az előadók és a gyakorlati oktatók nevének feltüntetésével. Mellékletben nem csatolható!

³ Pl. terepgyakorlat, kórlapelemzés, felmérés készítése stb.

⁴ Pl. házi feladat, beszámoló, zárthelyi stb. témaköre és időpontja, pótlásuk és javításuk lehetősége.

⁵ Elméleti vizsga esetén kérjük a tételsor megadását, gyakorlati vizsga esetén a vizsgáztatás témakörét és módját.

⁶ Az elméleti és gyakorlati vizsga beszámításának módja. Az évközi számonkérések eredményeink beszámítási módja.

REQUIREMENTS

Semmelweis University, Faculty of Medicine Name of the Institute: Department of Medical Biochemistry	
Name of the course: Medical Biochemistry II.	
Credits: 5	
Total number of hours: 70; lectures (hours): 42; practices (hours): 28	
Type of the course: <u>obligatory</u>	
Academic year: 2019/2020	
Code of the course²:	
Name of Head of the Department: Professor László Csanády M.D. Ph.D. D.Sc.	
Contact details: H-1094 Budapest, Tűzoltó u. 37-47. tel: +36-1-459-1500#60010 email: csanady.laszlo@med.semmelweis-univ.hu	
Position: Temporary Head of Department	
Habilitációjának kelte: 2013 száma: 341	
Aim of the course: The aim of the course is to comprehensively describe metabolic processes in the human body, from a medical point of view. The main theme of the semester is to elaborate further on carbohydrate and lipid metabolism commenced in Medical Biochemistry I, elaborate on amino acid and nucleotide metabolism, examine more thoroughly intermediary metabolism including the integration of processes throughout the organs and the human body as a whole. Furthermore, this course aims to afford to medical students the skills of being able to interpret complex physiological processes in the human body at a molecular level. During practices they discuss rapidly developing, promising areas of medicine ("tomorrow's medicine"). The medical biochemical orientation of the course is based on the presentation of molecular bases of diseases that pose serious public health problems (cardiovascular, neurodegenerative, cancer states), with particular emphasis on discussing potential molecular targets of therapy.	
Location of the course (lecture hall, practice room, etc.): Premises located in the Basic Medical Sciences building (laboratory rooms located on the first floor and lecture halls located on the ground floor).	
Upon the successful completion of the curriculum, the student should be able to: Identify biochemical structures, know and understand the reactions in which medically important molecules participate; know and understand inter-organ biochemical processes; know and understand integrated metabolic functions of the human body. Overall, such knowledge is essential for understanding physiological and pathological processes and, consequently, for making sound medical decisions.	
Prerequisite (s) for admission to the course: Medical Biochemistry I.	
Terms and Conditions for Starting Student Course (Minimum, Maximum), Student Selection Method: Not applicable for compulsory subjects.	
How to apply for the course: Application is through the Neptun online system.	
The course in thematic details³:	
Week	Lectures: weekly 2x70 min (3 hours) Lecturers: Prof. Ádám Veronika (ÁV)
	Practices (P): 2 hours every week

	<p>Prof. Csanády László (CSL) Prof. Kolev Kraszimir (KK) Dr. Komorowicz Erzsébet (KE) Dr. Szöllősi András (SZA) Dr. Törőcsik Beáta (TB) Prof. Tretter László (TL)</p>	
1	<p>Nitrogen balance. Digestion of proteins. Function of proteases, their regulation. Absorption of amino acids, amino acid transporters.</p> <p>Catabolism of amino acids. Elimination of ammonia, reactions and regulation of ornithine cycle.</p> <p>(KK,TL)</p>	P: Carnitine deficiency
2	<p>Degradation of amino acids: fate of their carbon skeleton. The role of vitamins in amino acid metabolism.</p> <p>Biosynthesis and degradation of heme. Iron homeostasis</p> <p>(KK, TL)</p>	P: Hereditary hyperammonemias
3	<p>Structure and function of nucleotides. The fate of nucleotides obtained through diet. Formation and elimination of uric acid; its metabolic role in humans. Molecular basis of gout.</p> <p>Synthesis and degradation of purine and pyrimidine nucleotides. Effects of cytostatic drugs on nucleotide metabolism.</p> <p>(KK)</p>	P: Vitamin B12 deficiency and methylmalonic acidemias
4	<p>Integration of metabolism. Metabolism of red blood cells. Red blood cell enzymopathies. Kidney metabolism, and dependence on fasting and acidosis. Metabolism of muscle and heart.</p> <p>Comparison of kidney and liver gluconeogenesis. Metabolic adaptation to physical effort.</p> <p>(TL, TB)</p>	P: Metabolism of exercise; doping.
5	<p>Metabolic characteristics of brain and adipose tissue. Metabolism of lymphocytes and intestinal epithel cells.</p> <p>The starvation-feeding cycle and its regulation. Regulation of hepatocyte metabolism in starvation.</p> <p>(TL, TB)</p>	P: Acute and chronic liver disease

6	<p>Molecular diversity of ion channels. Methods of ion channel examination. Molecular mechanism of gating and permeation. Voltage-gated K⁺ channels. ATP-sensitive K⁺ channels.</p> <p>Voltage-gated Cl⁻ channels. The CFTR chloride channel. The nicotinic acetylcholine receptor.</p> <p>(CSL, SZA)</p>	P: Tumor metabolism.
7	<p>Membrane transporters. Na⁺/K⁺ ATPase isoforms.</p> <p>Chemical neurotransmission. Cholinergic neurotransmission. Biosynthesis of acetylcholine. receptors, acetylcholine esterase. Molecular mechanism of exocytosis.</p> <p>(AV, TB)</p>	P: Tumor microenvironment, extracellular matrix
8	<p>Noradrenergic neurotransmission. Synthesis and metabolism of norepinephrine. Synaptic uptake.</p> <p>Adrenergic receptors. Molecular mechanism of epinephrine and norepinephrine effects on various organs.</p> <p>(AV, TB)</p>	P: The relationships of metabolism to the central nervous system.
9	<p>Dopaminergic and serotonergic neurotransmission. Synthesis, transporters, receptors. Biochemistry of Parkinson disease. Glutamatergic neurotransmission.</p> <p>NO: Regulatory role of NO. Nitric oxide synthase. Guanylate cyclase. Molecular effects of nitric oxide.</p> <p>(AV, TB)</p>	P: Gut-brain interaction through metabolites of the intestinal flora
10	<p>General overview of blood clot formation and elimination. Fibrinogen and fibrin. Prothrombin activation and regulation of thrombin activity. Triggers of blood clotting, amplification of the initiation.</p> <p>Inhibitors of blood coagulation and negative feedback mechanisms.</p> <p>(KK, KE)</p>	P: Molecular background of congenital thrombophilias
11	<p>Fibrinolysis. Activation of plasminogen. Inhibitors of plasmin.</p> <p>Cellular elements of the haemostatic system. Platelets and von Willebrand factor.</p> <p>(KK, KE)</p>	P: Molecular background of acquired thrombophilias.

12	Neutrophils and endothelial cells in haemostasis. Hemodynamic and biochemical interactions in haemostasis. The role of endothelial dysfunction in atherosclerosis. LDL oxidation and pattern-recognition receptors (TLR, scavenger receptors). Cholesterol induced pyroptosis. (KK, KE)	P: Atherosclerosis
13	The role of food ingredients in regulating gene expression. (TL). Signal transduction of metabolic pathways. Biochemical effects of thyroid hormones and their role in regulating metabolism and thermogenesis. (TL)	P: Molecular basics of weight control in physiological and pathological conditions.
14	Molecular entities and drug targets for proliferation, differentiation, survival, angiogenesis, metastasis. (TL,TB).	P: Molecular basis of body's energy consumption; dysregulation in metabolic syndrome

Potential overlap(s) with other topics: none

Requirement for special study: not applicable

Policy regarding attending practices; policy regarding absences:

Practices are mandatory. It is not possible to make up for missed practices. In case of absences amounting to more than 3 practices, the semester is not acknowledged. Arriving to a practice with a delay of more than 10 minutes is considered an absence.

Means of assessing acquired knowledge during the semester⁵:

not applicable

Requirement for acknowledging the semester, and for allowing the student to take the final exam: In case of absences amounting to more than 3 practices, the semester is not acknowledged.

Exam Type: Final. Form: written test exam, based on material of the official textbook, lectures and practices published at the department's Moodle e-learning system (<https://itc.semmelweis.hu/moodle/>).

Exam Requirements⁶: The material for the written test exam is the material of the lectures and practices in the subject, with the corresponding textbook chapters.

Types and modes of grading⁷:

The competition is held on week 13, and the structure of the competition is the same as that of the final. The top 5% scorers are exempted from the final exam.

The grade of the final exam is based on:

Written test:

This test consists of multiple choice questions (MCQs) from which max 65 points can be obtained.

Grade calculation of the semi-final exam:

60-65: grade 5 (excellent)

49-59: grade 4 (good)

41- 48: grade 3 (satisfactory)

33-40: grade 2 (pass)

If 32 and below, then the grade of the final exam is 'fail'.
How to apply for the exam: The exam dates are announced on the 12th week of the semester. We provide at least one exam date each week. Applications are made in the Neptun system in accordance with the University Study and Exam Rules.
Opportunities to repeat the exam: an exam can be re-taken only after two calendar days.
Printed, electronic and online notes, textbooks, tutorials, and literature for online learning (html for online material): Harper's Biochemistry (30th edition, or latest) Online material published at the department's Moodle e-learning system (https://itc.semmelweis.hu/moodle/).
A tárgyat meghirdető habilitált oktató (tantárgyfelelős) aláírása:
A gesztorintézet igazgatójának aláírása:
Beadás dátuma:

OKB véleménye:
Dékáni hivatal megjegyzése:
Dékán aláírása:

¹ Csak abban az esetben kell megadni, ha a tárgy az adott nyelven is meghirdetésre kerül.

² Dékáni Hivatal tölti ki, jóváhagyást követően.

³ Az elméleti és gyakorlati oktatást órákra (hetekre) lebontva, sorszámozva külön-külön kell megadni, az előadók és a gyakorlati oktatók nevének feltüntetésével. Mellékletben nem csatolható!

⁴ Pl. terepgyakorlat, kórlapelemzés, felmérés készítése, stb.

⁵ Pl. házi feladat, beszámoló, zárthelyi stb. témaköre és időpontja, pótlásuk és javításuk lehetősége.

⁶ Elméleti vizsga esetén kérjük a tételsor megadását, gyakorlati vizsga esetén a vizsgáztatás témakörét és módját.

⁷ Az elméleti és gyakorlati vizsga beszámításának módja. Az évközi számonkérések eredményeink beszámítási módja.