

## Faculty of Medicine, University of Rijeka

**Course title:** MEDICAL BIOLOGY  
**Course coordinator:** Alena Buretić-Tomljanović, PhD, Full Professor  
**Department:** Biology and Medical Genetics  
**Study program:** Integrated Undergraduate and Graduate University Study of Medicine in English  
**Course status:** compulsory  
**Year:** first year  
**Academic Year:** 2017/2018  
**ECTS workload coefficient:** 10.0  
**Workload (L+P+S):** 120 (L44+P36+S40)

## SYLLABUS

<b>Code</b>					
<b>Study program</b>	Integrated Undergraduate and Graduate University Study of Medicine in English				
<b>Course title</b>	<b>Medical Biology</b>			<b>Year</b>	<b>I.</b>
	<b>Lectures</b>	<b>Seminars</b>	<b>Practicals</b>	<b>Total</b>	<b>ECTS</b>
<b>Course structure</b>	<b>44</b>	<b>40</b>	<b>36</b>	<b>120</b>	<b>10,0</b>
Explanation: ECTS coefficient <b>10,0 (10x30h)</b> means <b>300 of total hours of work, i.e. 20 hours of work per week</b> (including lectures, seminars and practicals)					
<b>Coordinator</b>	Alena Buretić-Tomljanović, PhD, Full Professor			<a href="mailto:alenabt@medri.uniri.hr">alenabt@medri.uniri.hr</a>	
<b>Website:</b>	<a href="http://www.medri.uniri.hr">http://www.medri.uniri.hr</a> ; <a href="http://medical-studies-in-english.com/">http://medical-studies-in-english.com/</a>				
<b>Lecturers</b>	Saša Ostojić, MD, PhD, Full Professor Nada Starčević-Čizmarević, PhD, Assistant Professor Jadranka Vraneković, PhD, Assistant Professor Ivana Babić Božović, MD, PhD, Assistant Professor Sergej Nadalin, MD, PhD, Assistant Professor Ingrid Belac Lovasić, MD, PhD, Assistant Professor Nina Pereza, MD, PhD, Assistant Anita Barišić, MD, Assistant				
<b>Collaborators</b>	Rozi Andretić Waldowski, PhD, Assistant Professor				

**COURSE DESCRIPTION (Course information, basic description, general information, teaching overview, required equipment and preparation, etc.)**

The focus of Medical Biology is the study of the structure and function of the cell but also the functional interaction of the cell with its microenvironment. In this course we will focus on Eukaryotic cell biology and will cover topics, such as membrane structure and composition, transport, and trafficking, the cytoskeleton and cell movement, the breakdown of macromolecules and generation of energy and the integration of cells into tissues.

We will also cover important cellular processes such as cell division, cell cycle regulation, signal transduction, apoptosis (programmed cell death), stem and cancer cell biology and biology of reproduction. Furthermore, we will give insight into the fundamentals of molecular and systems biology, the flow of genetic information, human genome architecture and the basics of medical genetics.

Throughout the semester we will attempt to relate defects in these various cellular processes to human diseases to help gain a better understanding of what happens when cells don't work properly. In addition, the study of this course is also relevant to the fields of translational and regenerative medicine and drug discovery.

Classes are centered on discussion-oriented lectures and seminars that encourage critical thinking and emphasize the significance of research as a tool for obtaining knowledge. The practical part exposes students to an overview of modern cell-related and molecular biology-related techniques and offers a hands-on experience in classical cell biology experiments.

**GENERAL INSTRUCTIONAL AIMS**

During the course the students should acquire the following skills:

1. Oral and written communication,
2. The usage of information technology,
3. Evidence-based critical thinking and problem-solving
4. Individual and group work
5. Finding relevant scientific literature and acquiring scientific terminology

**SPECIFIC LEARNING OUTCOMES:** At the end of the course the student will be able to:

1. Describe the fundamental principles of cellular biology and apply them to current biological issues,
2. Understand how the cell structure relates to its functions,
3. Understand cell movement and how it is accomplished,
4. Understand how cells grow, divide, and die and how these processes are regulated,
5. Understand cell signaling and how it regulates cellular functions,
6. Understand how dysregulation of signaling processes leads to cancer and other diseases,
7. Interpret the behavior of cells in their microenvironment in multi-cellular organisms (i.e. a cell within its social context) with emphasis on cell-cell interactions, cell-extracellular matrix interactions,
8. Use the light microscope and prepare the slides,
9. Understand the main principles of Prokaryotic and Eukaryotic gene and genome organization, genome architecture, gene function and regulation,
10. Understand the basic genetic mechanisms and the mechanisms of genome maintenance,
11. Classify chromosomal and gene mutations,
12. Understand basic and advanced cytogenetic and molecular-genetic methods in mutation detection and differential genetic diagnosis,
13. Calculate and interpret the recurrence risk for monogenic and polygenic human diseases,
14. Understand the methods and results of scientific research in the field of cell and molecular biology,
15. Integrate the knowledge of different educational units; acknowledge the interdisciplinary nature of the biomedicine field.

## COURSE ASSESSMENT TOOLS

### (Important dates):

Midterm exam 1: April 23, 2018; Monday, 11:00 a.m. (35%)

Midterm exam 2: June 4, 2018; Monday, 11:00 a.m. (35%)

FINAL EXAM: As scheduled – comprehensive (30%)

### CLASS FORMAT

The course will be held in the summer term (Spring through Fall) between February 26th and June 6th, 2018 (15 weeks) and will consist of eight-hour class sessions per week. The schedule for the lectures, seminars and practicals along with the assigned lecturers and readings are listed in the tables titled “Course Teaching Plan” and „Course Schedule“ (below). Class session dates may vary with advance notice.

Homework and pre-class assignments will be required for several classes, mostly seminars. Pre-class assignments will be posted on Merlin. It is advisable that students log into the course on Merlin and check for updates regularly.

All practicals will be held in the practicum of the Department of Biology and Medical Genetics (2nd Floor, east wing of the building).

### Assigned reading:

1. Cooper, Geoffrey M; Hausman, Robert E. *The Cell. A Molecular Approach*. Sinauer Associates, Inc. Publishers Sunderland, Massachusetts U.S.A., Seventh Edition, ISBN 978-1-60535-290-9
2. Turnpenny, P; Ellard, S. *Emery's ELEMENTS of MEDICAL GENETICS*, *Elsevier*, 15th Edition , ISBN 978-0-7020-6685-6

### Optional / additional reading.

- 1) Alberts B et al.: *Molecular Biology of the Cell*, Philadelphia, Sixth Edition, Garland Publ. Co, 2015., ISBN 978-0-8153-4464-3

## COURSE TEACHING PLAN

### List of lectures, seminars and practicals

1st week February 26 <sup>th</sup> – March 2 <sup>nd</sup>		“The Cell“	
L1	Plan; literature		5
L2	Cell and Molecular Biology in Medicine		
L3	Cell Origin and Evolution		
L4	Tools of Cell Biology I		
L5	Tools of Cell Biology II		
S1	Cell Chemistry. Three Domains of Life: Prokaryotic and Eukaryotic Cells. Ring of Life.		3
2nd week March 5 <sup>th</sup> – 9 <sup>th</sup>			
L6	The Compartmentalization of Cells		3
L7	Structure of The Plasma Membrane		
L8	Transport of Macromolecules: Endocytosis and Exocytosis. Exosomes.		
S2	Transport of Small Molecules		2
P1	Basics of Light Microscopy. Prokaryotic cell.		3

<b>3rd week March 12<sup>th</sup> – 16<sup>th</sup></b>		
L9	Bioenergetics	2
L10	Cytoskeleton and Cell Movement	
S3	The Basics of Cell Signaling	3
S4	The Extracellular Matrix, Cell-Matrix and Cell-Cell Interactions	3

<b>4th week March 19<sup>th</sup> – 23<sup>rd</sup></b>		
L11	Regulation of the Cell Cycle I	3
L12	Regulation of the Cell Cycle II	
L13	Protein and Lipid Sorting and Transport I: Endocytic and Secretion pathways. The Role of Endosomes. Biogenesis of Lysosomes and Lysosomal Proteolysis. Autophagy.	
S5	Cell Division: Mitosis, Meiosis and Gametogenesis	3
P2	Eukaryotic Cell	3

<b>5th week March 26<sup>th</sup> – 30<sup>th</sup></b>		
L14	Protein and Lipid Sorting and Transport II: Protein Import into Mitochondria and Peroxisomes. Biogenesis and Functions of Peroxisomes.	3
L15	The Structure and Function of Nucleic Acids.	
L16	The Structure and Topological Organization of Chromatin	
S6	The Basics of Human Cytogenetics	2
P3	Mitosis in Plant and Animal Cells. Human Chromosomes.	3

<b>6th week April 2<sup>nd</sup> – 6<sup>th</sup></b>		
L17	The Nuclear Envelope and Nuclear Domains	2
L18	The Nuclear Bodies	
S7	Problems: Protein and Lipid Sorting, Transport and Other Topics of Cell Biology	2
P4	Meiosis. Gametogenesis.	3

<b>7th week April 9<sup>th</sup> – 13<sup>th</sup></b>		
L19	Genome Organization in Prokaryotes and Eukaryotes. The Human Genome.	2
L20	DNA Replication	
S8	Numerical Aberrations of Human Chromosomes	3
P5	Genomic DNA Extraction	3

<b>8th week April 16<sup>th</sup> – 20<sup>th</sup></b>		
L21	The Structure of Eukaryotic Genes	5
L22	Gene Mutations	
L23	DNA Repair	
L24	Regulation of Transcription I	
L25	Regulation of Transcription II	
S9	Human Chromosomal Rearrangements	3

<b>9th week April 23<sup>rd</sup> – 27<sup>th</sup></b>		
<b>Midterm Exam 1</b>		2
L26	Posttranscriptional Control of Gene Expression	1
L27	Translation	3
L28	Posttranslational Modifications of Proteins. Protein degradation: Ubiquitine-proteasome Pathway.	
S10	Problems: Monogenic and Polygenic Diseases Problems: The Flow of Genetic Information - from DNA to Protein	2
P6	The Relationship Between Chromatin Structure and Transcriptional Activity	3
<b>10th week April 30<sup>th</sup> – May 4<sup>th</sup></b>		
L29	Transcriptional regulation of Homeodomain Genes During Early Embryo Development	2
L30	Human Disease Models in <i>Drosophila melanogaster</i>	5
L31	Basics of Epigenetics I: Epigenetic Modifications	
L32	Basics of Epigenetics II: Genomic Imprinting	
P7	<i>Drosophila melanogaster</i> : A Model and a Tool in Medical Research	3
<b>11th week May 7<sup>th</sup> – May 11<sup>th</sup></b>		
L33	The Basics of Mendelian Genetics	4
L34	The Basics of Non-Mendelian Inheritance	
L35	Population Genetics	
L36	Human Genome Variation	
S11	Problems: Mendelian and Non-Mendelian Inheritance	2
S12	Problems: Flow of Genetic Information: from DNA to Protein	3
P8	Patterns of Disease Inheritance	2
<b>12th week May 14<sup>th</sup> – 18<sup>th</sup></b>		
P37	The Development and Causes of Cancer	3
P38	Abnormal Cell Cycle in Malignancy I	
P39	Abnormal Cell Cycle in Malignancy II	
S13	Noncoding RNA molecules.	2
P9	Molecular Oncogenesis in Clinical Practice	3
<b>13th week May 21<sup>st</sup> – 25<sup>th</sup></b>		
L40	Clinical Cytology in Early Detection of Cancer I	3
L41	Clinical Cytology in Early Detection of Cancer II	
L42	Programmed Cell Death and Cell Renewal. Stem Cells.	
S14	Human Fertilization and Early Embryonic Development	3
P10	Tumor Cell Biology	3
<b>14th week May 28<sup>th</sup> – June 1<sup>st</sup></b>		
L43	Tools of Molecular Biology I	2
L44	Tools of Molecular Biology II	
P11	Tools of Molecular Genetics	3

15th week June 4 <sup>th</sup> – 8 <sup>th</sup>		
Midterm Exam 2		2
P12	Examination (Practicals)	3

**Students' obligations:**

*1. ATTENDANCE*

Students are advised to attend all classes in order to avoid missing out on the material presented in class. In return the students can benefit from each other's contribution in class discussions. In case of absence from any class, the students are required to cover the material missed and inquire about any announcements made during their absence. **STUDENTS WHO ATTENDED LESS THAN 70% OF LECTURES, SEMINARS OR PRACTICALS HAVE FAILED THE COURSE.**

*2. PARTICIPATION*

*Lectures:*

Students should listen to the lectures and take detailed notes. They should be prepared to participate by taking occasional quizzes and by asking questions.

*Seminars:*

Obligatory preparation and active participation are required (assignment readings and working tutorials will be set before seminars). Working in small groups is an important aspect of seminar activity. Students are encouraged to prepare questions and actively engage with the lecturer in order to reach a conceptual understanding of the topic.

*Online forum & homework:*

The online forum is an example of an individual students' out-of-class activity. Several research assignments or take-home assignments (homework) may be given during the semester at ..

*Practicals:*

Students generally do not need to prepare for practicals. They need a plain notebook, drawing equipment (a pencil, crayons, a rubber, etc.) and a white (laboratory) coat.

*3. EXAMINATION*

Midterm exams and the final exam are obligatory. Midterm exams 1 and 2 are scheduled for the 9<sup>th</sup> and 15<sup>th</sup> week. The second midterm exam may be rescheduled, if necessary, for the week 13<sup>th</sup>.

Students arriving more than 10 minutes late for an exam will not be allowed to take the exam. In addition, under no circumstances will students be able to take an exam once other students have completed the exam and left the room.

**ASSESSMENT (Exam taking, detailed exam description oral/written/practical part, point distribution, grading criteria):**

**1. ASSESSMENT OF STUDENTS' WORK (EXAMS)**

Students may obtain a total of 100 credits: a maximum of 70 credits during the course and a maximum of 30 credits on the final exam (**Table 1**). Students must gain a minimum of 40 credits to be allowed to take the final exam. Those students who did not gain the required 40 credits (because of illness or other relevant reasons) will be given the opportunity to obtain the required credits after classes are over, but before taking the final exam. The latest grading scale is valid. The grading scale is valid for the current academic year.

Table 1. Distribution of Credits in the Medical Biology Course

Activity	Max. Credits
Attendance (lectures, practicals, individual and group work in seminars)	0
Activity in online forum	0
Midterm exams 1 and 2	70 (2 x 35)
Final exam (written and oral part)	30 (15 + 15)
Total	100

Throughout the course, students have two OBLIGATORY in-class midterm exams consisting of 50 multiple-choice questions each. Each correct answer is worth 0.7 credits (Table 2). Therefore, each midterm exam is worth max. 35 credits and two midterm exams together are worth max. 70 credits. The final exam, taking place after classes are over, consists of a written and oral part. The written part has 25 multiple-choice questions. Each correct answer is worth 0.6 credits ( $25 \times 0.6 = 15$ ). Each midterm exam takes about 80 minutes to complete while the written part of the final exam takes about 40 minutes to complete. The distribution of credits for midterm exams is presented in Table 2.

Table 2. Midterm examination – result evaluation

Percentage (%)	No. of correct answers	Credits
81- 100	41 - 50	28.7 – 35.0
71 - 80	36 - 40	25.2 – 28.0
61 – 70	31 - 35	21.7 – 24.5
51 – 60	26 - 30	18.2 – 21.0
41– 50	21 - 25	14.7 – 17.5
31 - 40	16 - 20	11.2 – 14.0
21 - 30	11 - 15	7.7 – 10.5
11 - 20	6 - 10	4.2 – 7.0
1 - 10	1 - 5	0.7 – 3.5

Exams will be based on the content of the lectures, seminars, practicals and assigned reading; however, the material covered in class will be emphasized. The final exam will be comprehensive.

If students, by taking two midterm exams, gain a total of 30.0 - 39.9 credits, they are allowed to take the final exam, but may only gain **the minimum number of credits required to pass** the exam (10.0 credits) and therefore only **the lowest final grade (sufficient 2, E)**.

In the written part of the final exam, which weighs max.15 credits, the students must give a correct answer to at least 40% of multiple-choice questions (i.e. 10 questions) to pass. The written part of the final exam is a prerequisite for the oral part. In case the student passes the oral examination, he/she may gain min. 4 and max. 15 credits. The distribution of credits on the final exam is presented in Tables 3 and 4. Ten questions will be asked; each answer is worth from 0 to 1.5 credits.

Table 3. Final Exam (written part) – result evaluation

Percentage (%)	No. of correct answers	Credits
84 - 100	21 - 25	12.6 – 15.0
76 - 80	19 - 20	11.4 – 12.0
64 – 72	16 - 18	9.6 – 10.8
56 – 60	14 - 15	8.4 – 9.0
44– 52	11 - 13	6.6 – 7.8
<b>40</b>	<b>10</b>	<b>6.0</b>
< 40	< 10	0

Table 4. Final Exam (oral part) – result evaluation

Grade	Credits
5	13.0 – 15.0
4	10.0 -12.5
3	7.0 – 9.5
2	4.0 - 6.5
1	0 -3.5

**FINAL GRADING CRITERIA:**

- A (5) – 80-100%,
- B (4) – 70-79.99%,
- C (3) – 60 – 69.99%,
- D (2) – 50 – 59.99%,
- E (2) – 40 – 49.99%,
- F and FX (1) – <40%



Final grading is presented in Table 5.

Table 5. Final Grading

	No. of correct answers	Credits	Percentage (%)	Final Grade
1. Midterm exam	38	26.6	76.0	
2. Midterm exam	42	29.4	84.0	
Final exam – written	15	9.0	60.0	
Final exam - oral	-	10.0	66.7	
<i>Total</i>		<i>75 / 100</i>		
<b>Final Grade</b>				<b>B</b>

Students will have the opportunity to prepare a written essay or a PowerPoint presentation on a topic approved by the course coordinator. The topic must be related to the course content. This activity IS NOT obligatory; however, it may bring students 7 additional credits.

Table 6. Summary of the Course Activities and Grading

Activity	Detailed Activity		Max. Grade Points
Attendance (lectures)	- active participation, - discussion		0
Attendance (practicals)	- slide preparation, - microscoping, - assignment and problem-solving	- individual work to pursue students' competence	0
Attendance (seminars)	- individual and group work, problem-solving, results' presentation	- obligatory preparation for the class (reading or research assignment)	0
Midterm exam 1	- objective evaluation of knowledge using multiple-choice questions	- includes content from L1-L23 S1-S9, P1-P5	35
Midterm exam 2	- objective evaluation of knowledge using multiple-choice questions	- includes content from L24-L44 S10-S14, P6-P12	35
Online forum	- finding and reading scientific literature; homework assignments	several assignments	0
Final exam	- written and oral examination	- includes content L1-L44, P1-P12, S1-S14 (comprehensive)	30
Essay writing or PowerPoint presentation	- presentation of scientific knowledge and results – NOT OBLIGATORY	- competence in reading and presenting scientific content; - ability to present scientific content briefly and clearly	7
		<b>Total</b>	<b>100 + 7</b>

**Possibility of teaching in another language:**

Croatian

**Other important information regarding the course:**

All information regarding lectures, reading assignments and homework will be posted on the Merlin website which may be entered on <https://moodle.srce.hr/2017-2018/>.

**Correspondence:** For questions or concerns, please feel free to send us a message by email or by using the Merlin website and we will do our best to respond within 24 to 48 hours. Only students who are registered for the course will have access to the Merlin website protected under a password. The password will be given by the course coordinator. If you cannot access the website, inform prof. Buretić-Tomljanović at [alenabt@uniri.hr](mailto:alenabt@uniri.hr). Students are expected to check their Merlin accounts frequently for important course updates/information.

**Office visits:** If you want to speak with us during office hours, please let us know by email or in class.

**Academic policies:** As a student enrolled in this course and at the University of Rijeka you should be familiar with the policies that govern the institution's academic processes. For example, Academic Dishonesty, Enrollment Status, and Grades and Grading. Please read the Undergraduate Academic Policies at [www.uniri.hr](http://www.uniri.hr), [www.medri.hr](http://www.medri.hr) and <http://medical-studies-in-english.com/>.

Academic dishonesty by students enrolled in undergraduate and graduate courses and programs offered by the Department of Biology and Medical Genetics will not be tolerated. Academic dishonesty includes, but is not limited to:

1. Obtaining assistance from another individual during an examination.
2. Giving assistance to another individual during an examination.
3. The unauthorized use of study material or textbooks during an examination.
4. Changing answers on a test after it has been returned and then submitting it for regrading.
5. Plagiarizing written assignments. Plagiarizing includes, but is not limited to: a) copying laboratory reports from previous years, b) copying or paraphrasing reports, term papers, or those prepared by other students, c) unauthorized collaboration in the preparation of reports, term papers or theses, and d) use of another author's materials without appropriate acknowledgement through quotation and citation.
6. Attempting to bribe or otherwise induce an instructor to alter either a grade or examination score

## COURSE SCHEDULE (Spring Semester; for academic year 2017/2018)

Date	Lecture (time & place)		Seminars (time & place)		Practicals (time & place)		Lecturer
<b>Week 1</b>							
Monday 26/2/2018	L1-	11:00 - 12:00	-		-		Prof. A. Buretić-Tomljanović, PhD
	L2-	12:00 -13:00	-		-		Prof. A. Buretić-Tomljanović, PhD
Tuesday 27/2/2018	L4	10:00 -11:00	-		-		Ass.Prof. Nina Pereza, MD, PhD
	L3	13:00 – 14:00	-		-		Prof. Saša Ostojić, MD, PhD
	L5	14:00 – 15:00	-		-		Ass. Prof. Nina Pereza, MD, PhD
Wed. 28/2/2018	-		S1	14:00 – 17:00	-		Prof. A. Buretić-Tomljanović, PhD
<b>Week 2</b>							
Monday 5/3/2018	L6-	11:00 - 12:00	-		-		Prof. A. Buretić-Tomljanović, PhD
	L7-	12:00 -13:00	-		-		Prof. A. Buretić-Tomljanović, PhD
	-		-		P1A	13:00 - 16:00	Ass. Prof. Nina Pereza, MD, PhD
Tuesday 6/3/2018	L8-	10:00 - 11:00	-		-		Prof. A. Buretić-Tomljanović, PhD
	-		S2	13:00-15:00	-		Ass. Prof. Jadranka Vranekovic, PhD
Wed. 7/3/2018	-		-		P1B	13:00 – 16:00	Ass. Prof. Nina Pereza, MD, PhD
<b>Week 3</b>							
Monday 12/3/2018	L9-	11:00 - 12:00	-		-		Prof. Saša Ostojić, MD, PhD
	L10-	12:00 -13:00	-		-		Prof. A. Buretić-Tomljanović, PhD
Tuesday 13/3/2018	-		S3	10:00-11:00	-		Prof. A. Buretić-Tomljanović, PhD
	-			14:00-16:00	-		Ass. Prof. Sergej Nadalin, MD, PhD
Wed. 14/3/2018	-		S4	13:00-16:00	-		Ass. Prof. Nina Pereza, MD, PhD
<b>Week 4</b>							
Monday 19/3/2018	L11-	11:00 - 12:00	-		-		Prof. Saša Ostojić, MD, PhD
	L12-	12:00 -13:00	-		-		Prof. Saša Ostojić, MD, PhD
	-		S5	13:00-16:00	-		Ass. Prof. Sergej Nadalin, MD, PhD
Tuesday 20/3/2018	L13-	10:00 - 11:00	-		-		Prof. A. Buretić-Tomljanović, PhD
	-		-		P2A	13:00 – 16:00	Ass. Prof. Sergej Nadalin, MD, PhD
Wed. 21/3/2018	-		-		P2B	13:00 – 16:00	Ass. Prof. Sergej Nadalin, MD, PhD
<b>Week 5</b>							
Monday 26/3/2018	L14-	11:00 - 12:00	-		-		Prof. A. Buretić-Tomljanović, PhD
	L15-	12:00 -13:00	-		-		Prof. Saša Ostojić, MD, PhD
	-		S6	13:00-15:00	-		Ass. Prof. Jadranka Vranekovic, PhD
Tuesday 27/3/2018	L16-	10:00 - 11:00	-		-		Prof. A. Buretić-Tomljanović, PhD
	-		-		P3A	13:00 – 16:00	Ass.Prof.Nada Starčević-Č, PhD
Wed. 28/3/2018	-		-		P3B	13:00 – 16:00	Ass.Prof.Nada Starčević-Č, PhD
<b>Week 6</b>							

Monday 2/4/2018	<b>(Holiday (L17, L18 &amp; S7 will take place at our earliest convenience by Prof. Alena Buretić-Tomljanović)</b>					
Tues. 3/4/2018	-	-	P4A	13:00 – 16:00	Anita Barišić, MD	
Wed. 4/4/2018	-	-	P4B	13:00 – 16:00	Anita Barišić, MD	
<b>Week 7</b>						
Monday 9/4/2018	L19-	11:00 - 12:00	-	-	Prof. Saša Ostojić, MD, PhD	
	L20-	12:00 -13:00	-	-	Prof. Saša Ostojić, MD, PhD	
	-	-	S8	13:00-1600	Ass. Prof. Jadranka Vranekovic, PhD	
Tues. 10/4/2018	-	-	P5A	13:00 – 16:00	Ass. Prof. Nada Starčević-Č., PhD	
Wed. 11/4/2018	-	-	P5B	13:00 – 16:00	Ass. Prof. Nada Starčević-Č., PhD	
<b>Week 8</b>						
Monday 16/4/2018	L21-	11:00 - 12:00	-	-	Prof. A. Buretić-Tomljanović, PhD	
	L22-	12:00 -13:00	-	-	Ass.Prof. Nina Pereza, MD, PhD	
	-	-	S9	13:00 – 16:00	Ass. Prof. Jadranka Vranekovic, PhD	
Tuesday 17/4/2018	L23-	10:00 -11:00	-	-	Ass. Prof. Sergej Nadalin, MD, PhD	
	L24-	13:00–14:00	-	-	Prof. A. Buretić-Tomljanović, PhD	
	L25-	14:00-15:00	-	-	Prof. A. Buretić-Tomljanović, PhD	
<b>Week 9</b>						
Monday 23/4/2018	<b>Midterm Exam 1 (11:00 - 13:00)</b>				Prof. A. Buretić-Tomljanović, PhD	
	-	-	S10	13:00 – 15:00	Ass.Prof. Nina Pereza, MD, PhD	
Tuesday 24/4/2018	L26	10:00 -11:00	-	-	Prof. A. Buretić-Tomljanović, PhD	
	-	-	-	P6A	14:00 – 17:00	Ass.Prof. Nina Pereza, MD, PhD
Wed. 25/4/2018	-	-	-	P6B	13:00 – 16:00	Ass.Prof. Nina Pereza, MD, PhD
<b>Week 10</b>						
Monday 30/4/2018	L29-	11:00 - 12:00	-	-	Ass. Prof. Rozi Andretić Waldowski, PhD	
	L30	12:00 -13:00	-	-	Ass. Prof. Rozi Andretić Waldowski, PhD	
	-	-	-	P7A	13:00 – 16:00	Ass. Prof. Rozi Andretić Waldowski, PhD
Tues. 1/5/2018	<b>Holiday (L27, L28, L31 &amp; L32 will take place at our earliest convenience by Prof. Alena Buretić-Tomljanović and Ass. Prof. Nina Pereza)</b>					
Wed. 2/5/2018	-	-	P7B	13:00 – 16:00	Ass. Prof. Rozi Andretić Waldowski, PhD	
<b>Week 11</b>						
Monday 7/5/2018	L33	11:00 - 12:00	-	-	Ass. Prof. Ivana Babić, MD, PhD	
	L34	12:00 -13:00	-	-	Ass. Prof. Ivana Babić, MD, PhD	
	L35	13:00-14:00	-	-	Ass. Prof. Ivana Babić, MD, PhD	
	-	-	-	P8-AB	14:00-16:00	Ass.Prof. Nina Pereza, MD, PhD
Tuesday 8/5/2018	L36-	10:00 -11:00	-	-	Prof. A. Buretić-Tomljanović, PhD	
	-	-	-	S11	13:00 – 15:00	Ass. Prof. Ivana Babić, MD, PhD
Wed. 9/5/2018	-	-	-	S12	13:00 – 16:00	Ass. Prof. Sergej Nadalin, MD, PhD

<b>Week 12</b>						
Monday 14/5/2018	L37-	11:00 - 12:00	-	-	Prof. Saša Ostojčić, MD, PhD	
	L38-	12:00 -13:00	-	-	Prof. A. Buretić-Tomljanović, PhD	
	-	-	-	P9A-	13:00 – 16:00	Ass. Prof. Ingrid Belac Lovasic, MD, PhD
Tues. 15/5/2018	L39-	10:00 -11:00	-	-	Prof. A. Buretić-Tomljanović, PhD	
	-	-	S13	14:00-16:00	-	Ass.Prof. Nina Pereza, MD, PhD
Wed. 16/5/2018	-	-	-	P9B	13:00 – 16:00	Ass. Prof. Ingrid Belac Lovasic, MD, PhD
<b>Week 13</b>						
Monday 21/5/2018	L40-	11:00 - 12:00	-	-	Prof. Saša Ostojčić, MD, PhD	
	L41	12:00 -13:00	-	-	Prof. Saša Ostojčić, MD, PhD	
	-	-	-	P10A	13:00-16:00	Prof. Saša Ostojčić, MD, PhD
Tuesday 22/5/2018	L42-	10:00 – 11:00	-	-	Ass.Prof. Sergej Nadalin, MD PhD	
	-	-	S14	13:00-16:00	-	Ass.Prof. Sergej Nadalin, MD, PhD Anita Barišić, MD
Wed. 23/5/2018	-	-	-	P10B	13:00 – 16:00	Anita Barišić, MD
<b>Week 14</b>						
Monday 28/5/2018	L43-	11:00 - 12:00	-	-	Ass. Prof. Nada Starčević-Č., PhD	
	L44-	12:00 - 13:00	-	-	Ass. Prof. Nada Starčević-Č., PhD	
	-	-	-	P11A	13:00-16:00	Ass. Prof. Nada Starčević-Č., PhD
Tues. 29/5/2018	-	-	-	P11B	13:00 – 16:00	Ass. Prof. Nada Starčević-Č., PhD
<b>Week 15</b>						
Monday 4/6/2018	<b>Midterm Exam 2 (11:00-13:00)</b>					Prof. A. Buretić-Tomljanović, PhD
Tuesday 5/6/2018				P12	13:00 – 16:00	examination (practicals)

**List of lectures, seminars, and practicals:**

	<b>LECTURES (Topic)</b>	<b>Teaching Hours</b>	<b>Lecture Room</b>
L1	Plan; literature	1	9
L2	Cell and Molecular Biology in Medicine	1	9
L3	Cell Origin and Evolution	1	9
L4	Tools of Cell Biology I	1	9
L5	Tools of Cell Biology II	1	9
L6	The Compartmentalization of Cells	1	9
L7	Structure of The Plasma Membrane	1	9
L8	Transport of Macromolecules: Endocytosis and Exocytosis.	1	9
L9	Bioenergetics	1	9
L10	Cytoskeleton and Cell Movement	1	9
L11	Regulation of the Cell Cycle I	1	9
L12	Regulation of the Cell Cycle II	1	9
L13	Protein and Lipid Sorting and Transport I: Endocytic and Secretion pathways. The Role of Endosomes. Biogenesis of Lysosomes and Lysosomal Proteolysis. Autophagy.	1	9
L14	Protein and Lipid Sorting and Transport II: Protein Import into Mitochondria and Peroxisomes. Biogenesis and Functions of Peroxisomes.	1	9
L15	The Structure and Function of Nucleic Acids.	1	9
L16	The Structure and Topological Organization of Chromatin	1	9
L17	The Nuclear Envelope and Nuclear Domains	1	9
L18	The Nuclear Bodies	1	9
L19	Genome Organization in Prokaryotes and Eukaryotes. The Human Genome.	1	9
L20	DNA Replication	1	9
L21	The Structure of Eukaryotic Genes	1	9
L22	Gene Mutations	1	9
L23	DNA Repair	1	9
L24	Regulation of Transcription I	1	9
L25	Regulation of Transcription II	1	9
L26	Posttranscriptional Control of Gene Expression	1	9
L27	Translation	1	9
L28	Posttranslational Modifications of Proteins. Protein Degradation: Ubiquitin-Proteasome Pathway.	1	9
L29	Transcriptional regulation of Homeodomain Genes During Early Embryo Development	1	9
L30	Human Disease Models in <i>Drosophila melanogaster</i>	1	9

L31	Basics of Epigenetics I: Epigenetic Modifications	1	9
L32	Basics of Epigenetics II: Genomic Imprinting	1	9
L33	The Basics of Mendelian Genetics	1	9
L34	The Basics of Non-Mendelian Inheritance	1	9
L35	Population Genetics	1	9
L36	Human Genome Variation	1	9
L37	The Development and Causes of Cancer	1	9
L38	Abnormal Cell Cycle in Malignancy I	1	9
L39	Abnormal Cell Cycle in Malignancy II	1	9
L40	Clinical Cytology in Early Detection of Cancer I	1	9
L41	Clinical Cytology in Early Detection of Cancer II	1	9
L42	Programmed Cell Death and Cell Renewal. Stem Cells.	1	9
L43	Tools of Molecular Biology I	1	9
L44	Tools of Molecular Biology II	1	9
	<b>Total:</b>	<b>44</b>	

	<b>Seminars (Topics)</b>	<b>Teaching Hours</b>	<b>Lecture Room</b>
S1	Cell chemistry. Three Domains of Life. Prokaryotic and Eukaryotic Cells. The Ring of Life.	3	9
S2	Transport of Small Molecules	2	9
S3	The Basics of Cell Signaling	3	9
S4	The Extracellular Matrix, Cell-Matrix and Cell-Cell Interactions	3	9
S5	Cell Division: Mitosis, Meiosis and Gametogenesis	3	9
S6	Basics of Human Cytogenetics	2	9
S7	Problems: Protein and Lipid Sorting, Transport and Other Topics of Cell Biology	2	9
S8	Numerical Aberrations of Human Chromosomes	3	9
S9	Human Chromosomal Rearrangements	3	9
S10	Problems: Monogenic and Polygenic Diseases	2	9
S11	Problems: Mendelian and Non-Mendelian Inheritance	2	9
S12	Problems: The Flow of Genetic Information - from DNA to Protein	3	9
S13	Noncoding RNA molecules	2	9
S14	Human Fertilization and Early Embryonic Development	3	9
	I. Midterm exam	2	9
	II. Midterm exam	2	9
	<b>Total:</b>	<b>40</b>	

	<b>Practicals (content)</b>	<b>Teaching Hours</b>	<b>Lecture Room</b>
P1	Basics of Light Microscopy. Prokaryotic cell.	3	Dept. of Biology
P2	Eukaryotic cell.	3	Dept. of Biology
P3	Mitosis in Plant and Animal Cells. Human Chromosomes.	3	Dept. of Biology
P4	Meiosis. Gametogenesis.	3	Dept. of Biology
P5	Genomic DNA Extraction	3	Dept. of Biology
P6	The Relationship Between Chromatin Structure and Transcriptional Activity	3	Dept. of Biology
P7	<i>Drosophila melanogaster</i> : A Model and a Tool in Medical Research	3	Dept. of Biology
P8	Patterns of Disease Inheritance	3	9
P9	Molecular Oncogenesis in Clinical Practice	3	Dept. of Biology
P10	Tumor Cell Biology	3	Dept. of Biology
P11	Tools of Molecular Genetics	3	Dept. of Biology
P12	Examination (practicals)	3	9
	<b>Total:</b>	<b>36</b>	

	<b>Final Exam Dates</b>
1.	<b>13/6/2018</b>
2.	<b>27/6/2018</b>
3.	<b>11/7/2018</b>
4.	<b>6/9/2018</b>
5.	<b>20/9/2018</b>