

Medical biophysics 2

2019

Topic list #1

Topics asked in the first midterm

A) Lectures: weeks 1–5

- Generation and properties of X-ray (II/3.1.)
- Fundamentals of X-ray diagnostics (VIII/3.1. and VIII/4.3.)
- Thermodynamics: equilibrium, change, laws (III/3.3. and III/3.4.)
- Transport processes I: Diffusion, Brownian motion, osmosis (III/2.)
- Transport processes II: Flow of fluids and gases, blood as fluid (III/1.)

Sources required for preparation:

- Lectures: everything told and written by the lecturer including the demonstrated experiments and the projected material, as well as the lecture slides uploaded to the website
- The Textbook (Damjanovich–Fidy–Szöllösi: Medical Biophysics): all chapters shown in brackets

B) Laboratory Practices: weeks 1–5

- Dosimetry (Lab Manual: 15.; Textbook: II/4.1., II/4.2. and II/4.3.)
- Coulter counter (Lab Manual: 23; Textbook: VII/1.1.4.)
- X-ray (Lab Manual: 13.; Textbook: II/3.1..)
- Gamma energy (Lab Manual: 11.; Textbook: II/3.2.1., VII/1.5.3. and VIII/3.2.)
- Amplifier (Lab Manual: 18.; Textbook: VII/1.4.)

Sources required for preparation:

- Laboratory practices: material told and written by the lab teacher and/or TA including the demonstrated experiments and the projected material, as well as the individual measurements
- The evaluation and drawings/graphs prepared for the lab report (according to the tasks listed on the website)
- The Lab Manual (Kellermayer: Medical Biophysics Practices): all chapters shown in brackets
- The Textbook (Damjanovich–Fidy–Szöllösi: Medical Biophysics): all chapters shown in brackets

C) Calculation Problems:

- Lab Manual (3rd edition): 21-23, 41, 45, 47-51, 56, 57, 59
- Amplifier further calculations: [all of them](#)
- Diffusion lecture further calculations: [all of them](#)

Sources required for preparation:

- The Lab Manual (Kellermayer: Medical Biophysics Practices): chapter 31: "Problems"
- .pdf documents under the "Homework problems" tab of the subject on the website

Besides everything mentioned above, we assume that you know – even though we will not explicitly ask – the complete material of the "Mathematical and Physical Basis of Medical Biophysics" and the "Medical biophysics I" subject

The form of the midterm is a written test containing open questions about theory, labs, drawings, and calculations. One may partake in the midterm only if a **passport** or **residence card** is presented. One may use a **pen** with blue ink (for drawings: **pencil**), a non-programmable **calculator** that cannot store textual information in its memory, and a **ruler** during the midterm – all these have to be provided for by oneself. Formula collections are provided by the department; own copies may not be used. Results of the midterm will be announced by the lab teacher.