

## **SYLLABUS**

**SUBJECT** BIOCHEMICS

**TEACHER** AGNIESZKA BANAŚ, PhD

### **COURSE DESCRIPTION**

1. Introduction to chemical bases and biochemistry (1 hour)
2. Biomolecules structure and biosynthetic pathways– amino acids, peptides, proteins, carbohydrates, enzymes, fatty acids, lipids, purine and pyrimidine bases, DNA and RNA. (4 hours)
3. Metabolism: glycolysis, gluconeogenesis, the citric acid cycle, oxidative phosphorylation, Calvin cycle and pentose phosphate pathway, glycogen metabolism, fatty acid metabolism, protein and amino acid metabolism. (6 hours)
4. Genetics: genetic code, DNA replication, and gene expression (transcription, translation), mutagenesis and genetic diseases.(3 hours)
5. Final test (1 hour)

### **TUTORIALS:**

(PRESENTATIONS GIVEN AND PREPARED BY STUDENTS ON THE FOLLOWING SUBJECTS FROM THE FIELD OF BIOCHEMISTRY)

1. Enzymes. Types and characteristic
2. Genetics, science of heredity
3. Mutagenesis
4. Genetic diseases
5. Genetically modified organisms - food
6. Human hormones - how to achieve balance
7. Free radicals and antioxidants, cell aging, cell death
8. Nutrition – supplements and vitamins
9. Oil and fat, essential fatty acids. Healthy and unhealthy fats and oils
10. Different approaches towards diet
11. Final test

### **ECTS 4**

#### **LEARNING OUTCOMES**

At the end of the course, students should understand the fundamental knowledge on biomolecules (amino acids, carbohydrates, proteins, fatty acids, lipids, DNA, RNA), their structures, properties and functions as well as principles on metabolic pathways. Additionally, students will get the knowledge on genetic code, genetic diseases and gene expression. The purpose of the biochemistry tutorials is to expand students' knowledge about the issues from the field of biochemistry concerning health and illness, food and nutrition, physical activity,

genetic modifications, cloning and heredity. Tutorials will give additionally the possibility to exercise their presentation skills.

### **GRADING POLICY**

Students are expected to attend every lecture. The last class is designed for the final exam assessing students' knowledge about the material covered during lectures. The final grade will be based on the points obtained during the test.

On each tutorial, student is suppose to give one powerpoint presentation. The final grade will be based on the evaluation of presentations and activity.

### **TIMETABLE**

90 min (2 hours) lecture/ 8 weeks

90 min (2 hours) tutorial/ 8 weeks

Total: 15 hours + 15 hours

### **TEXTBOOK AND REQUIRED MATERIALS**

Basic reference material:

Biochemistry, Jeremy M. Berg, John L. Tymoczko, Lubert Stryer, Sixth Edition 2006.  
Biochemia. Podręcznik dla studentów uczelni medycznych. Edward Bańkowski.  
Urban&Partner Wrocław 2010.

Additionally, students will be given publications and suggested literature helpful in powerpoint presentation.

### **PREREQUISITES:**

Elementary knowledge in basic chemistry and cellular biology is required.

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Data i podpis nauczyciela akademickiego