DIPARTIMENTO DI SCIENZE

COURSE: APPLIED BIOCHEMISTRY			
ACADEMIC YEAR: **2019-2020**			
TYPE OF EDUCATIONAL ACTIVITY: **Characterizing**			
TEACHER: **Dott. Simona Todisco**			
e-mail: simona.todisco@unibas.it		website: **http://www2.unibas.it/stodisco/**	
phone: **0971205086**		mobile (optional):	
Language: **Italian**			
ECTS: **10** (**8** lessons and **2** tutorials/practice)	n. of hours: **88** (**64 l**essons and **24** tutorials/practice)	Campus: **Potenza** Dept./School: **Department of Sciences** Program: **Pharmacy (LM-13)**	Semester: **II** **(from 02 march 2020 to 31 may 2020-20 june 2020)**

EDUCATIONAL GOALS AND EXPECTED LEARNING OUTCOMES

The main goal is to provide tools to understand the metabolic changes in phisiological conditions (feeding, fasting and exercise). The main knowledge will be:

- Principles of nutritional biochemistry;
- Main metabolic processes and their metabolic regulation;
- Basic technique for the study of biomolecules.

Main skills will be:

- Able to relate the biochemical processes of different human organs;
- Able to analyze the metabolic changes in various physiological conditions;
- Able to describe the main biochemical methodologies.

Theoretical skills will be important for future studies on the effects of drugs, on their mechanism and their design.

PRE-REQUIREMENTS

Knowledges of Biology, General and Inorganic Chemistry and Biochemistry are obligatory

SYLLABUS

Part I Metabolism of macromolecules and tissue nutrient requirements. **(52h)** Carbohydrates, Proteins, Lipids. Micronutrients: vitamins and minerals **(10h)**. Cell communication, signal transduction. Metabolic functions of the liver. Glucose homeostasis. Disorders of glucose metabolism. **(12h)** Hepatic metabolism of lipids.**(6h)** Hepatic metabolism of proteic and non-proteic nitrogen **(6h)**. Metabolism and toxicity of ethanol. Hepatic detoxification. Cytochrome P450. The oxygen molecule and the formation of toxic compounds. Endogenous and exogenous antioxidants. **(8h)** Muscle metabolism, adipose tissue metabolism and interactions with other organs and tissues. **(10h)**

Part II Laboratory Techniques (12h + 24h laboratory) The technology of cell cultures. Fractional precipitation of proteins. Dialysis and ultrafiltration. Purification of enzymes. Enzymatic techniques. Fundamentals of enzyme kinetics. Measurement of enzyme activity. Applications of enzymes in analytical and biomedical field. Centrifugative techniques. Applications. Electrophoresis: Methods of detection and quantitative evaluations. UV/Vis Spectroscopy Applications: qualitative and quantitative analysis. Spectrofluorimetry Applications: qualitative and quantitative analysis. Luminescence.

TEACHING METHODS

The organization of course is: 64 h lesson and 24h practice/laboratory. 52h of lesson are dedicated to **Part I** (**Metabolism of macromolecules and tissue nutrient requirements**). 12 h of lesson are dedicated to **Part II (Laboratory Techniques)** and 24h of practice in laboratory. Students will be grouped (max 20 students for group) for 5/6 practices in laboratory of about 4 h each one. At the end of each practice, a report must be delivered.

The knowledge and understanding of the topics are guaranteed through group and individual classroom exercises focused on some topics covered and through the reports of laboratory experience.

The teaching instruments will be: blackboard, computer and video to powerpoint presentations, available on **http://www2.unibas.it/stodisco/ (the password will be provided during the lessons)**

EVALUATION METHODS

The exam is oral and consists in the evaluation of theoretical knowledge of the student together with the ability to link different topics of the course. Also the knowledge of laboratory practices made by the student will be evaluated. The final grade is expressed in thirtieths and will be given by the sum of the two evaluations: the knowledge and understanding of the topics covered in class (90%), the comprehension of the laboratory exercises (10%).

TEXTBOOKS AND ON-LINE EDUCATIONAL MATERIAL

- Ugo Leuzzi, Ersilia Bellocco, Davide Barreca **:** *Biochimica della nutrizione* *Zanichelli*
- J.W. Baines; M.H. Dominiczak: *Biochimica per le discipline biomediche*, II ediz. Ambrosiana Editrice
- David L Nelson, Michael M Cox: *I principi di biochimica di Lehninger* Zanichelli
- Maria Carmela Bonaccorsi di Patti, Roberto Contestabile, Martino Luigi Di Salvo**:** *Metodologie Biochimiche* Ambrosiana ed.
- *Stoppini , Bellotti: Biochimica applicata. Edises*
- Teaching materials on the web site **http://www2.unibas.it/stodisco/**
- Laboratory notes on the web site **http://www2.unibas.it/stodisco/**

INTERACTION WITH STUDENTS

At the begin of the course, a list of students is compiled with name, surname email and badge number.
The teacher receives students all days in his office (room 3A241) after contact via email: **simona.todisco@unibas.it**

EXAMINATION SESSIONS (FORECAST)[1]

17/01/2020; 21/02/2020; 20/02/2020; 17/04/2020; 19/06/2020; 17/07/2020; 4/09/2020; 23/10/2020; 11/12/2020;

SEMINARS BY EXTERNAL EXPERTS YES ☐ NO ☑

FURTHER INFORMATION

[1]Subject to possible changes: check the web site of the Teacher or the Department/School for updates.