



# UNIVERSITÀ DEGLI STUDI DI PALERMO

<b>DEPARTMENT</b>	Scienze Psicologiche, Pedagogiche, dell'Esercizio Fisico e della Formazione		
<b>ACADEMIC YEAR</b>	2020/2021		
<b>MASTER'S DEGREE (MSC)</b>	SCIENCE OF PREVENTIVE AND ADAPTED PHYSICAL ACTIVITY AND SPORT PERFORMANCE		
<b>INTEGRATED COURSE</b>	ADAPTABILITY AND ADAPTATIONS IN SPORT TRAINING - INTEGRATED COURSE		
<b>CODE</b>	13508		
<b>MODULES</b>	Yes		
<b>NUMBER OF MODULES</b>	2		
<b>SCIENTIFIC SECTOR(S)</b>	BIO/10, BIO/09		
<b>HEAD PROFESSOR(S)</b>	PROIA PATRIZIA	Professore Associato	Univ. di PALERMO
<b>OTHER PROFESSOR(S)</b>	RUSSO GIUSEPPE	Ricercatore	Univ. di PALERMO
	PROIA PATRIZIA	Professore Associato	Univ. di PALERMO
<b>CREDITS</b>	9		
<b>PROPAEDEUTICAL SUBJECTS</b>			
<b>MUTUALIZATION</b>			
<b>YEAR</b>	1		
<b>TERM (SEMESTER)</b>	2° semester		
<b>ATTENDANCE</b>	Not mandatory		
<b>EVALUATION</b>	Out of 30		
<b>TEACHER OFFICE HOURS</b>	<b>PROIA PATRIZIA</b> Thursday 10:00 13:00 Via Pascoli, 6 Secondo piano <b>RUSSO GIUSEPPE</b> Monday 9:00 10:00 Previa prenotazione sull'email giuseppe.russo15@Unipa.it, l'incontro avverrà su Teams:" canale ricevimento studenti Scienze Motorie Prof. Giuseppe Russo Fisiologia Umana".		

**DOCENTE:** Prof.ssa PATRIZIA PROIA

<b>PREREQUISITES</b>	Basic skills of biochemistry
<b>LEARNING OUTCOMES</b>	<p>Knowledge and understanding: To acquire knowledge of the main metabolic pathways in order to choose the best energy substrates depending on the type of sport. Know the various food and energy supplements and their effect on the energy yield and speed of absorption.</p> <p>Ability in implementing knowledge and understanding: ability to analyze the performance after taking some foods; ability to identify energy substrates necessary to achieve the best performance in order to avoid any deficiencies that may cause damage to the athlete or failures; ability to design and plan the possible integration of ergogenic foods in physical activity over the time.</p> <p>Judgment autonomy: Be able to assess the physical and physiological test results and/or the performance in order to make changes to the training program and/or diet.</p> <p>Communicative skills: ability to present the results of tests carried out, even to a non-expert public; being able to support the importance and clarify the effects on physical motor activity.</p> <p>Learning skills: updating of skills through workshops, specialized seminars or consultation of scientific publications in their field</p>
<b>ASSESSMENT METHODS</b>	Oral exam
<b>TEACHING METHODS</b>	Frontal lectures

**MODULE  
PHYSIOLOGY APPLIED TO SPORT**

*Prof. GIUSEPPE RUSSO*

**SUGGESTED BIBLIOGRAPHY**

Attività Fisica, fisiologia, adattamenti all'esercizio, prevenzione, sport terapia e nutrizione  
a cura di Giuseppe D'Antona Poletto Editore

W.D. McArdle, F. I. Katch, V. L. Katch Fisiologia Applicata allo Sport Casa Editrice Ambrosiana  
Cindy Stanfield Fisiologia editore Edises

Cindy L. Stanfield Fisiologia Edises

<b>AMBIT</b>	21001-Attività formative affini o integrative
<b>INDIVIDUAL STUDY (Hrs)</b>	54
<b>COURSE ACTIVITY (Hrs)</b>	21

**EDUCATIONAL OBJECTIVES OF THE MODULE**

Knowledge of sport and physical activity effects.

**SYLLABUS**

<b>Hrs</b>	<b>Frontal teaching</b>
4	Energy for this activity 'physics: energy value of food, the release of energy in physical exercise, energy metabolism, measurement of energy metabolism, energy expenditure at rest and during muscular work, energy cost of walking, running and swimming, power measurement delivered and interindividual differences.
4	The transport system and oxygen use: the structure and function of the respiratory system, gas exchange in the blood and their transport, control of pulmonary ventilation.
4	Cardiovascular system, cardiovascular regulation, capacity 'function of the cardiovascular system.
4	Renal Physiology, structure and function of skeletal muscles, neuromuscular control.
2	Training of capacity 'aerobic and anaerobic, muscle strength, support to improve performance and athletic conditioning.
3	Body composition, energy balance, activity 'physical and health: the determination of body composition, physical structure and performance in different sports, obesity' and weight control, activity 'physical health and aging Up down'

## MODULE APPLIED BIOCHEMISTRY FOR SPORTS

*Prof.ssa PATRIZIA PROIA*

### SUGGESTED BIBLIOGRAPHY

Fondamenti di Biochimica dell'esercizio fisico. Michael E. Houston. Edizione Calzetti Mariucci  
Biochimica per le scienze motorie- Di Giulio, Fiorilli, Stefanelli- Casa Editrice Ambrosiano

<b>AMBIT</b>	50541-Biomedico
<b>INDIVIDUAL STUDY (Hrs)</b>	108
<b>COURSE ACTIVITY (Hrs)</b>	42

### EDUCATIONAL OBJECTIVES OF THE MODULE

The aim of the course is to apply the chemical and biochemical principles acquired in the basal courses, adapting to the motor activity. Particularly, it will depth the knowledge about the fate of the final products of the main energy metabolisms. It will also give hints of the possible performance evaluation using biochemical markers. Also it will try to figure out how to modulate the expression of some key enzymes that regulate the main metabolisms, through training.

## SYLLABUS

Hrs	Frontal teaching
3	Performance assessment through the biochemical markers analysis
5	Alactacid anaerobic metabolism. Creatine supplements uses. Absorption and catabolism. Historical notes on the discovery and function of phosphocreatine and creatinine. Spatial and temporal buffering of creatine.
1	Case study on "Creatine supplementation and effect on performance"
6	The glucose metabolism. Lactate anaerobic metabolism. Lactate fate following the recent discoveries. The use by the brain. The new frontier of lactate as "hormone-like" on brain activation.
3	Fatty acids metabolism. Different types of fatty acids. Omega 3 and 6 fatty acids. Metabolic interactions between lipid and glucose metabolism
4	Aminoacid metabolism. Use and absorption of protein supplements. Supplementation of BCAA.
3	Hydration and salt supplementation during exercise and recovery after exercise. Functional feeding and physical activity.
3	New frontiers of doping. Supplements of banned substances such as anabolic steroid hormones. Gene doping.
3	Digestion and absorption of food
3	Oxidative stress: reactive oxygen and nitrogen species
4	Removal of reactive oxygen species and defense systems against damage caused from free radicals
2	Ergogenic supports