



**UNIVERSITÀ DEGLI STUDI
DELL'INSUBRIA**

SCHOOL OF MEDICINE

DESCRIPTION OF THE CURRICULUM
(TEACHING REGULATIONS OF THE COURSE))

MASTER'S DEGREE COURSE

IN SCIENCES OF PREVENTIVE AND ADAPTED PHYSICAL ACTIVITIES (LM-
67 R - Sciences and techniques of preventive and adapted physical activities)

A.Y. 2025/2026



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Art. 1 - General information and organization

Preventive and Adaptive Physical Activity Sciences is a master's degree programme that integrates the University's undergraduate programme in Physical Activity and Sports Sciences. The programme aims to train professionals with advanced skills in planning and administering physical exercise and sports therapy for individuals with special needs (such as the elderly, frail patients, disabled individuals, post-rehabilitation patients, etc.), with the aim of primary and secondary prevention, combating chronic conditions, and improving lifestyle and quality of life.

The creation of the course was necessary given the demographic *context* in which the Italian population is one of the oldest in the world, with high rates of chronic diseases and disabilities, as confirmed by recent ISTAT and ISS reports. This is compounded by a very high rate of sedentary lifestyle, a significant risk factor for the development of cardiovascular, metabolic, and oncological diseases. Furthermore, there is still insufficient implementation in our country of the so-called Adapted Physical Activity (APA), which encompasses movement, physical activity, and sport, with a particular focus on the abilities of individuals with physical disabilities. Finally, there is a pressing need to recruit master's degree graduates with specific skills in sports for disabled people (for the promotion of sport as *early rehabilitation* in various areas of physical and mental disability and technical-sports training in disciplines approved by the Italian Paralympic Committee).

The new professional figures trained by this master's degree will be able to find employment in the following fields:

- . **public sector:** rehabilitation institutes, research centers and IRCCS, hospitals, AST, schools, etc.
- . **private sector:** companies active in fitness and wellness, sports clubs for the disabled, spas, wellness centers, private schools, etc. New corporate fitness models are also emerging as possible career opportunities, directly within companies and industrial contexts.

The School of Medicine (a coordinating body established pursuant to Law 240/2010) is responsible for managing the degree program, coordinating and streamlining the program's teaching activities. The degree program is offered through the collaboration of the Departments of Medicine and Surgery and Biotechnology and Life Sciences.

The President of the Degree Programme Council is Professor Giampiero Merati.

The relevant academic office is the School of Medicine Office, which receives appointments via the Microsoft Teams platform and responds to emails received via INFOSTUDENTI. The web application provides a communication channel with various University offices (including Student Offices, Integrated Student Services – Right to Education, Orientation and Placement Services, and Academic Offices) and is available to students and external users. This system allows students to submit questions and receive responses, attach documents, and track the status of their requests.

Art. 2 - Admission to the study program

Admission requirements and access methods

Admission to the Master's Degree Course is open.

To be admitted to the Master's Degree in Preventive and Adapted Physical Activity Sciences, students must possess one of the following curricular requirements:

- a three-year degree obtained in class L-22, degree in physical activity and sports sciences;
- a three-year degree obtained in class L-33 (formerly Ministerial Decree 509/99), degrees in physical activity and sports sciences (or equivalent qualification);



- a four-year degree in Sport Sciences obtained according to the previous legislation (before the Reform);
- a qualification obtained abroad and recognized as suitable in the field of motor activity and sports or in any case with content consistent with the aims of the course.

Once the requirements are met, the adequacy of the candidate's personal preparation will be verified, which will take place according to the procedures specifically defined in the Degree Course's teaching regulations.

Non-EU foreign students may be admitted in accordance with the provisions in force and through the competent Italian diplomatic or consular authorities in their country.

Admission also requires an adequate knowledge of the Italian language equivalent to level B1 of the Common European Framework of Reference for Modern Languages of the Council of Europe.

Without the above-described curricular requirements, it is not possible to enroll in the master's degree programme.

Initial preparation verification methods

The assessment of personal preparation will focus on the following topics:

- basic knowledge of Anatomy;
- general knowledge of neuromuscular, cardiorespiratory and exercise physiology.

Further information on scheduling the personal preparation assessment test is available on the Degree Course web page.

Art. 3 - Transfer procedures from other degree courses

Recognition of previous careers

Students from other degree programs who have successfully passed the admission test with limited access may submit a specific request for recognition of previous studies to the Student Administration Office, along with their application for enrollment in the degree program. This request must specify the activities for which they wish to have recognition. For further details on how to apply for recognition of previous studies, please refer to the University website page dedicated to the Degree Programs of the School of Medicine.

Applications for admission to years subsequent to the first

Applications for admission to years after the first, following a request for authorization, are accepted for vacant positions in individual years of the program. For further information on the deadlines, criteria, and evaluation methods for applications, please refer to the Rector's Decree published annually on the University website. A special commission, appointed by the Degree Programme, examines the student's academic record and proposes the ranking of those admitted to years after the first for approval by the Degree Programme Council.

Art. 4 - Simultaneous enrollment in two study programs

Pursuant to Law No. 33 of April 12, 2022, "Provisions regarding simultaneous enrollment in two higher education programs" and subsequent Ministerial Decrees 930/2022 and 933/2022, students are permitted to simultaneously enroll in

two programmes. Requests for dual enrollment will be evaluated by a dedicated programme committee, after verifying admission requirements.

Art. 5 - The educational path

Degree programme includes mandatory training activities worth 120 credits, of which 20 credits are dedicated entirely to internships and 8 credits are for elective activities.

Teaching is conducted conventionally, and therefore the degree program is taught entirely in person. For activities other than practical and laboratory work, limited online teaching may be provided, up to a third of the total.

The University Educational Credit (CFU) is a measure of the amount of learning, including individual study, required of a student with adequate initial preparation to acquire knowledge and skills in the learning activities required by the degree program regulations, as indicated in Article 5 of Ministerial Decree 270/04.

Each training activity (teaching, laboratory, internship or thesis, etc.) of the degree courses corresponds to a specific whole number of training credits (CFU).

Each CFU corresponds to 25 hours of student commitment, including hours of training activities in the presence of the teacher, and hours of independent study and personal reworking, necessary to complete the training.

The credits corresponding to each training activity are acquired by the student after passing the proficiency exam or other form of proficiency assessment established in the course's teaching regulations.

Teaching methods adopted for the delivery of training activities

Face-to-face lessons: (up to a maximum of 8 hours/CFU)

It is the main and fundamental activity of teaching; the student attends the lesson given by the teacher and independently processes the content heard.

Technical Practical Activities (ATP): (up to a maximum of 15 hours/CFU)

This activity allows us to clarify lesson content through the development of applications. No content is added to the lessons; they are associated with the lessons and do not exist independently.

- training internship: 25 hours / CFU

Internships: The Degree Program uses the AlmaLaurea platform to organize curricular internships. Interns carry out their activities at public and private facilities affiliated with the university, such as sports clubs, schools, gyms, and rehabilitation centers.

The service is provided by the Degree Course Internship Desk, which is responsible for providing the necessary assistance to students and external companies/institutions to ensure that the internship/traineeship activity is carried out effectively.

Methods of verifying training activities

The assessment methods for training activities can be written or oral and may include ongoing activities and project work.

The assessment and evaluation methods are detailed in the course syllabuses.

Art. 6 - Graduation exams

To be admitted to the final exam, students must have earned all the credits for the educational activities planned in the study plan and required by the academic regulations, and have passed all the exams and qualifications, including those relating to the internship.

Drafting and dissertation of the thesis



The final exam will consist of a master's thesis, which will be defended by the candidate during the graduation session in the presence of a committee. The thesis will be written under the supervision of a supervisor.

The thesis preparation, which draws on the experience of the training internship, offers an opportunity to interface with the research world in the rehabilitation field, and therefore to come into contact with the most advanced research methods in the field and to study the analytical methods and techniques used to construct scientific papers.

The thesis developed cannot be of the "compilatory" type, but exclusively **experimental**.

The Master's thesis must therefore generally follow the **structure of a scientific article** (IMRAD), and will therefore include the acquisition, processing, and discussion of original data collected during the training period.

This project will also help students learn the fundamentals and procedures for writing a scientific paper, from studying the initial bibliographic references, designing the most appropriate type of study, to collecting and statistically analyzing the acquired data, and finally to discussing the results in light of similar findings already published in the relevant scientific literature. The supervisor and co-supervisor will assist in this process.

The supervisor must be a tenured or contract professor, while the co-supervisor may also be an external figure (e.g. the company tutor for the internship).

Thesis points may range from a minimum of 5 to a maximum of 10. Since there are no compilation theses, the modulation between 5 and 10 will be given solely by the quality of the work.

No additional points are awarded.

The thesis score will be added to the weighted average of the student's grades in each exam, which is graded out of 30. Therefore, activities that require a final grade are excluded from the average.

A 30 cum laude will be counted as a 33/30 in the final average which will be calculated out of one hundred and ten with the possible attribution of honours.

No co-examiners will be appointed; the thesis papers must be sent to all members of the committee according to the deadlines established by the academic secretariat. This way, the discussion will be entrusted to all committee members in a more collegial manner.

The graduate must bring a **presentation of the thesis in Power Point format to the session**. The presentation must last a maximum of 10 minutes plus 5 minutes for discussion.

The schedule of sessions with the registration procedures for the final exam is available on the dedicated web page. Upon graduation, a Diploma Supplement is issued. This informative report accompanies the official qualification and describes the nature, level, context, content, and status of the studies undertaken and completed by the student. It is issued in both Italian and English. The purpose of the document is to provide independent data for the international transparency of qualifications (diplomas, degrees, certificates, etc.) and to enable equitable academic and professional recognition, promoting student mobility. The Diploma Supplement complies with the Europass standard.

ATTACHMENTS

Annex 1 – Study Plan



Annex 1 – Study Plan

SCHEDULED TEACHING - 2025/2026 COHORT

Scheduled teaching refers to the set of courses planned for the entire study program, which must be taken by all students enrolling in the current academic year (enrollment cohort) to complete their studies and obtain their qualification.

1st YEAR – MANDATORY COURSES							
SEM	Name of INTEGRATED COURSE/SUBJECT	SUBJECT	SSD	TAF / DISCIPLINARY AREA	ECT S-C	HOURS	VERIFICATION METHOD *
1	HUMAN MOVEMENT THEORY AND KINESIOLOGY	THEORY OF HUMAN MOVEMENT	M-EDF/02	B/Physical and Sports Disciplines	4	DE: 16 ATP: 30	V
		KINESIOLOGY	MED/34	B/ Bio - medical disciplines	4	DE: 32	
1	DEVELOPMENTAL PSYCHOLOGY AND PATHOPHYSIOLOGY OF AGING	DEVELOPMENTAL PSYCHOLOGY AND PSYCHOLOGICAL FUNCTIONS	M-PSI/04	B/Psychological and Pedagogical Disciplines	4	DE: 32	V
		EXERCISE PHYSIOLOGY IN ADULTHOOD AND ELDERLY AGE	BIO/09	B/ Bio - medical disciplines	2	DE:16	
1	BIOLOGICAL SIGNALS AND MOTOR ASSESSMENT TOOLS	LABORATORY EVALUATION METHODS AND TOOLS AND DATA ANALYSIS	M-EDF/01	C/Similar or integrative	4	DE: 16 ATP: 30	V
		FIELD EVALUATION METHODS AND TOOLS	M-EDF/02	B/ Physical and Sports Disciplines	5	DE: 16 ATP: 45	
2	MOTOR AND PHARMACOLOGICAL APPROACH TO CARDIORESPIRATORY AND METABOLIC DISEASES	MOTOR APPROACH AT DIFFERENT AGES	M-EDF/02	B/ Physical and Sports Disciplines	2	DE: 8 ATP: 15	V
		APPROACH TO METABOLIC DISEASES	MED/13	B/ Bio - medical disciplines	2	DE: 16	
		MEDICINES AND PHYSICAL ACTIVITY	BIO/14	C/Similar or integrative	2	DE: 16	
2	LOCOMOTOR SYSTEM PATHOLOGIES AND PHYSIOKINESITHERAPY	TRAUMATOLOGY AND FUNCTIONAL RECOVERY OF THE LOCOMOTOR SYSTEM	MED/33	B/ Bio - medical disciplines	3	DE: 24	V
		REATHLETISATION OF THE INJURED PATIENT AND SECONDARY PREVENTION	MED/34	C/Similar or integrative	3	DE: 24	
2	NEUROLOGICAL PATHOLOGIES AND NEURO-MOTOR RE-EDUCATION	MOTOR ACTIVITY FOR NEUROLOGICAL PATIENTS	M-EDF/02	B/ Physical and Sports Disciplines	3	DE: 24	V
		MEDICAL ASPECTS OF NEUROLOGICAL DISEASES	MED/26	B/ Bio - medical disciplines	3	DE: 24	
2	ELEMENTS OF HEALTH MARKETING AND PROMOTION OF SPORTS INITIATIVES		SPS/08	B/Sociological Disciplines	5	DE: 40	V
2nd YEAR – MANDATORY COURSES							



SEM	Name of INTEGRATED COURSE/SUBJECT	SUBJECT	SSD	TAF / DISCIPLINARY AREA	ECT S-C	HOURS §	VERIFICAT ION METHOD *
1	ADAPTED PHYSICAL ACTIVITY		M-EDF-02	B/ Physical and Sports Disciplines	6	DE: 24 ATP:45	V
1	PHYSICAL ACTIVITY IN CHILDHOOD AND ADOLESCENCE WITH ELEMENTS OF PSYCHOPEDAGOGY	PSYCHO-PEDAGOGICAL ASPECTS OF PHYSICAL ACTIVITIES	M-PED/03	B/Psychologic al and Pedagogical Disciplines	3	DE: 24	V
		THEORY, TECHNICAL AND DIDACTICS OF PHYSICAL EXERCISE ADAPTED TO YOUTH	M-EDF/01	B/ Physical and Sports Disciplines	3	DE: 16 ATP: 15	
		CHILD NEUROPSYCHIATRY	MED/39	B/Biomedical	2	DE: 16	
1	PHYSICAL AND SPORT ACTIVITIES ADAPTED TO THE PHYSICALLY AND MENTALLY DISABLED	TECHNICAL AND DIDACTIC THEORY OF PHYSICAL ACTIVITIES FOR THE PHYSICALLY DISABLED	M-EDF/02	B/ Physical and Sports Disciplines	4	DE: 16 ATP: 30	V
		TECHNICAL AND EDUCATIONAL THEORY OF PHYSICAL ACTIVITIES FOR THE MENTALLY DISABLED	M-EDF/02	B/ Physical and Sports Disciplines	4	DE: 16 ATP: 30	

2nd YEAR – ONE COURSE TO CHOOSE FROM

SEM	Name of INTEGRATED COURSE/SUBJECT	SUBJECT	SSD	TAF / DISCIPLINARY AREA	ECT S-C	HOURS §	VERIFICAT ION METHOD *
2	TECHNIQUES FOR PRESERVING POSTURE AND BALANCE	THEORIES AND TECHNIQUES OF MUSCLE STRETCHING	M-EDF/02	B/ Physical and Sports Disciplines	4	DE: 16 ATP: 30	V
		BALANCE PROBLEMS IN DEVELOPMENTAL DISORDERS AND MOVEMENT DISORDERS	MED/31	C/Similar or integrative	2	DE: 16	
			M-EDF/02		2	ATP: 30	
2	PROMOTION OF HEALTHY LIFESTYLES	ELEMENTS OF FOOD HYGIENE AND SPORTS NUTRITION	MED/49	C/Similar or integrative	2	DE: 16	V
			M-EDF/02		2	ATP: 30	
		GREEN EXERCISE AND OUTDOOR SPORTS AND PHYSICAL ACTIVITIES	M-EDF/02	B/ Physical and Sports Disciplines	4	DE: 16 ATP: 30	
2	POSTURAL AND RESPIRATORY SYNERGIES IN TERRESTRIAL AND AQUATIC ENVIRONMENTS	POSTUROLOGY AND RESPIRATORY TRAINING	MED/10	C/Similar or integrative	2	DE: 16	V
			M-EDF/02		2	ATP: 30	
		PHYSICAL ACTIVITY IN AN AQUATIC ENVIRONMENT	M-EDF/02	B/ Physical and Sports Disciplines	4	DE: 16 ATP: 30	
2	HUMAN MOVEMENT ANALYSIS: BIOMECHANICAL AND COMPUTATIONAL APPROACHES	BIOMECHANICS OF MOVEMENT	M-EDF/02	B/ Physical and Sports Disciplines	4	DE: 16 ATP: 30	V
		ARTIFICIAL INTELLIGENCE METHODS APPLIED TO MOVEMENT AND SPORT	ING-INF/05	C/Similar or integrative	2	DE: 16	
			M-EDF/02		2	ATP: 30	

2nd YEAR – OTHER MANDATORY TRAINING ACTIVITIES



SEM	Name INTEGRATED COURSE	Name TEACHING	S. SD	TAF / DISCIPLINARY AREA	CFU	HOURS §	VERIFICAT ION METHOD *
A	AT THE STUDENT'S CHOICE		//	D/A student's choice	8	//	V
A	APPRENTICESHIP		//	F/For internships and traineeships	18	//	I
A	ENGLISH	FURTHER LINGUISTIC KNOWLEDGE	//	Further training activities/F1	3	//	I
2	FINAL TEST	FOR THE FINAL EXAM	//	Final exam/E1	15	//	V

§ DE – HOURS of TEACHING DELIVERY (in the classroom) ; ATP – HOURS of TECHNICAL AND PRACTICAL
ACTIVITIES;

* V – EXAM I – SUITABILITY

Annex 2 – Summary of the objectives of the compulsory courses

HUMAN MOVEMENT THEORY AND KINESIOLOGY

The course provides the theoretical and applied foundations for understanding human movement through the principles of kinesiology. The muscular, skeletal, and nervous systems will be analyzed in relation to the production and control of movement. Concepts of biomechanics, functional anatomy, and physiology of movement will be addressed, particularly the spine, as the central stabilizing base of movement. The course also explores the main physical theories and models of physical learning and control, especially those related to typical human movements such as *sit-to-stand*, heavy weight throwing (especially the *overhead* techniques typical of sport throwing), and walking and running. Particular attention will be given to the observation, evaluation, and classification of human movement in various contexts (educational, athletic, and clinical). Finally, practical exercises in physical gesture analysis will be offered, using a multidisciplinary and integrated approach. A basic knowledge of anatomy and physiology is recommended.

DEVELOPMENTAL PSYCHOLOGY AND PATHOPHYSIOLOGY OF AGING

The course aims to provide students with a basic understanding of the main topics addressed by Developmental Psychology. Specifically, a historical overview of the most widely accepted theories will be presented and their evolution within current human development studies will be analyzed. Certain psychological aspects of development will be explored in depth: cognitive, emotional, and social. Throughout the course, emphasis will be placed on the relationship and interaction between individuals and their growth contexts.

1 Dublin descriptor: knowledge and understanding.

Basic knowledge of the main theories, findings, and most recent research in developmental psychology. Understanding human development across the life cycle.

Dublin Descriptor 2: Applied knowledge and understanding.

Understanding the mechanisms of cognitive, affective, and socioemotional development across the lifespan. Ability to connect theoretical aspects and practical applications.

Dublin descriptor 3: autonomy of judgment.

Ability to use acquired knowledge to connect the various topics covered, knowing how to distinguish between typical and atypical development. Ability to interpret individual needs in psychological terms.

Dublin Descriptor 4: Communication Skills.

Ability to describe the topics covered clearly and using appropriate specific scientific language.

Dublin Descriptor 5: Ability to Learn.

Ability to apply the theoretical and methodological principles of developmental psychology to real-world situations in order to better understand related psychosocial issues.

BIOLOGICAL SIGNALS AND PHYSICAL ASSESSMENT TOOLS

The course aims to provide the knowledge to independently study sports movements or physical activities, instructing students on the physiological mechanisms involved, the instrumentation used to detect the physical quantities of interest, and the statistical processing and analysis of collected data. The course introduces the understanding and analysis of biological signals relevant to the study of human movement. The principles of acquisition, processing, and interpretation of electromyographic (EMG) and electrocardiographic (ECG) signals, as well as movement kinematics using inertial sensors, will be addressed. Tools and technologies used in physical

assessment, such as force platforms, electromyographs, and *motion systems, will be presented. Capture* and wearable sensors. The course integrates theory and practice with exercises in data collection and analysis. Applications in clinical, sports, and ergonomics will be discussed. Particular attention will be paid to the validity and reliability of measurements. A basic knowledge of physiology, anatomy, and fundamentals of movement analysis is required.

PHYSICAL AND PHARMACOLOGICAL APPROACH TO CARDIORESPIRATORY AND METABOLIC DISEASES

The course aims to provide students with theoretical and practical skills in integrating exercise and pharmacological treatment for cardiorespiratory and metabolic diseases. The main cardiovascular (hypertension, ischemic heart disease, heart failure), respiratory (COPD, asthma), and metabolic (type 2 diabetes, obesity, dyslipidemia) diseases will be analyzed. The underlying pathophysiological mechanisms, the systemic effects of drugs, and the impact of exercise on clinical outcomes will be studied. Significant attention will be given to the design of personalized exercise programs. International guidelines for prescribing physical activity in clinical populations will be discussed. The course also includes elements of pharmacokinetics and pharmacodynamics of the most commonly used drugs, as well as a study of contraindications and precautions in at-risk individuals.

A multidisciplinary approach will be supported, exploring the potential synergy between physicians, kinesiologists, and pharmacists. Finally, an introduction to technologies for monitoring habitual physical activity (wearable devices, telemedicine) will be provided, and common criteria for evaluating efficacy through clinical and functional indicators will be examined.

LOCOMOTOR SYSTEM PATHOLOGIES AND PHYSIOKINESITHERAPY

The course analyzes the major musculoskeletal disorders of orthopedic, rheumatic, and trauma origin. The anatomical, functional, and pathophysiological foundations of osteoarticular and musculotendinous structures will be explored. Acute and chronic conditions will be examined: fractures, osteoarthritis, scoliosis, tendinopathy, lumbago, meniscal and ligament injuries. The course includes diagnostic and classification elements useful for clinical assessment and guiding the client toward functional recovery. Attention will be given to post-rehabilitation and re-athleticization methods for injured athletes, as well as the study of post-injury and post-surgical functional recovery protocols. Finally, numerous clinical cases will be discussed to integrate theory and practice, and a broad introduction to functional assessment tests (*Range of Motion*, strength, VAS scale, performance tests) will be provided. The principles of segmental, global, and proprioceptive kinesitherapy will be described.

NEUROLOGICAL PATHOLOGIES AND NEURO-MOTOR RE-EDUCATION

The course aims to provide basic knowledge of neuroanatomy and neurophysiology of the central and peripheral nervous systems. Furthermore, knowledge of neural functions and the neurobiological basis of nervous system diseases will be provided. Attention will be paid to the methodological and technological aspects useful for studying the nervous system and its functioning in normal and pathological conditions, especially in chronic-degenerative diseases.

The expected learning outcomes at the end of the course will be the following:

- Knowledge of the general principles of morphology of the nervous system, its connections and its functioning.
- Basic knowledge of the clinical aspects and possible rehabilitation perspectives of the main neurological pathologies of the central and peripheral nervous system.



ELEMENTS OF HEALTH MARKETING AND PROMOTION OF SPORTS INITIATIVES

Marketing concepts applied to healthcare and sports. The dynamics of communication, promotion, and patient/user loyalty in healthcare and physical activity services will be analyzed. Market analysis tools and service positioning will be explored. Attention will be given to developing strategies for promoting sports initiatives and prevention and wellness programs. The course will also include practical examples and *case studies* relating to public and private campaigns. Regulatory and ethical aspects of healthcare promotion will also be addressed. Teaching activities will include group work, simulations, and *project work*. A basic knowledge of economics and communications science is helpful.

TECHNIQUES FOR PRESERVING POSTURE AND BALANCE

The teaching activity concerns the following topics:

- Biomechanics throughout human evolution;
- The different forms of locomotion and posture in primates;
- The large morpho-functional complexes in quadrupeds and bipeds;
- Anthropometry: the variability of anthropometric data, anthropometric norms;
- Human phenotypic, genotypic, and cultural adaptation.

PROMOTION OF HEALTHY LIFESTYLES

The course provides students with basic knowledge on promoting and implementing strategies for maintaining or achieving healthy lifestyles through structured physical activity programs and knowledge of food hygiene principles. Furthermore, the course aims to provide the practical skills needed to design and administer structured physical activity programs, with particular emphasis on aquatic and outdoor environments.

The knowledge and skills acquired in this course are the foundational prerequisites of the professionalism of Kinesiologists of Preventive and Adapted Motor Activities.

The integrated course consists of the following three modules:

1. Physical activity in an aquatic environment
2. Elements of food hygiene and sports nutrition
3. *Green exercise* and outdoor physical and sport activities

POSTURAL AND RESPIRATORY SYNERGIES IN TERRESTRIAL AND AQUATIC ENVIRONMENTS

The course explores the integration of postural control and respiratory function in different environmental contexts. The neuromuscular mechanisms that regulate balance, stability, and breathing will be analyzed, with particular attention to their functional synergy. The reciprocal influences between posture and breathing in static and dynamic conditions will be studied. The course also explores the biomechanical and physiological differences between terrestrial and aquatic environments. Finally, assessment strategies and targeted interventions will be proposed in the areas of prevention, sports, and rehabilitation. Postural, respiratory, and movement analysis tools will be used for this purpose. Practical activities will include both classroom and pool exercises. A basic knowledge of anatomy, physiology, and kinesiology is recommended.

HUMAN MOVEMENT ANALYSIS: BIOMECHANICAL AND COMPUTATIONAL APPROACHES



The course provides the theoretical and practical foundations for analyzing human movement through biomechanical and computational methods. The fundamentals of functional anatomy, kinematics, and movement dynamics will be covered. The main tools and most common technologies (especially computerized) for data acquisition (*motion capture systems*), inertial sensors, ground reaction forces, and computerized systems for *match analysis will be presented*. Students will learn how to process biomechanical signals and use musculoskeletal models. The course also includes concepts of movement simulation and prediction using specialized softwares. Applications in the clinical, sports, and post-rehabilitation fields will be analyzed, particularly aimed at post-injury rehabilitation. Laboratory work and case studies will complement the learning experience. A basic knowledge of physics and computer science is required.