**Degree course in Physiotherapy**

**INSEGNAMENTO INTEGRATO: PEDIATRIC CLINICAL SCIENCES**
**CFU: 7**
**SSD: MED/33, MED/38, MED/39, MED/50**
**COORDINATOR: PROF. EMAIL:**

MODULE: APPLIED TECHNICAL AND MEDICAL SCIENCES
CFU: 2
SSD: MED/50
PROFESSOR: Antonio Di Lascio email: antonio.dilascio@unicamillus.org
Office hours: by appointment

MODULE : GENERAL AND SPECIALIZED PEDIATRICS
CFU: 1
SSD: MED/38
PROFESSOR: Anna Claudia Romeo email: annaclaudia.romeo@unicamillus.org

MODULE : GENERAL AND SPECIALIZED PEDIATRICS
CFU: 1
SSD: MED/38
PROFESSOR: Giovanna Maragliano email: giovanna.maragliano@unicamillus.org

MODULE : LOCOMOTIVE SYSTEM DISEASE
CFU: 1
SSD: MED/33
PROFESSOR: PROF. GABRIELE BOVE email : gabriele.bove@unicamillus.org

MODULE : CHILD NEUROLOGY
CFU: 2
SSD: MED/39
PROFESSOR: PROF. ANDREA ROMIGI email: andrea.romigi@unicamillus.org

**PREREQUISITES**

APPLIED TECHNICAL AND MEDICAL SCIENCES
*Although there is no prerequisite, in order to understand and be able to apply the topics covered in integrated teaching from a professional point of view, adequate knowledge of the biological and biochemical basis of life, anatomy (especially of the musculoskeletal system), histology and human physiology, applied physics, computer science and data processing systems..*

GENERAL AND SPECIALIZED PEDIATRICS
*Basics of human anatomy, genetics and physiology, with regard to functions of main organs and apparatus. Basic knowledge of biology/embryology, immunology and infectious diseases.*

CHILD NEUROLOGY

*Basic concepts of Histology and Human Anatomy. Principles of Human Physiology, Cellular Biology and Biochemistry. Basic elements of Physic. Fundamentals of General Pathology.*

LOCOMOTIVE SYSTEM DISEASE

*Muscoloskeletal anatomy knowledge*

**LEARNING OBJECTIVES**

APPLIED TECHNICAL AND MEDICAL SCIENCES

*Learning objective is the knowledge of the technologies of diagnostic imaging available today, the technical and practical aspects, the radiation protection aspects and any precautions necessary for the pediatric field for the implementation of radiological practices to support the rehabilitation process are essential objectives. The course aims to provide every element useful for knowing how to use radiological imaging appropriately.*
*These objectives will be achieved through lectures designed to facilitate learning and improve the ability to face and solve the main questions relating to diagnostic imaging in pediatric age.*

GENERAL AND SPECIALIZED PEDIATRICS

*The course intends to promote specific learning about physiology and most important pathologies of neonatal and pediatric age. Specific attention will be dedicated to prenatal and neonatal care, physiology of neonatal transition at birth, promotion of breastfeeding and prevention of neonatal and pediatric injuries.*

GENERAL AND SPECIALIZED PEDIATRICS

The course intends to promote specific learning about physiology and most important pathologies of pediatric age. The student will acquire knowledge about the pathogenic mechanisms as well as clinical manifestations and management of major pediatric diseases. Specific attention will be dedicated to immunization, respiratory tract diseases, infectious diseases and immune-mediated diseases with special focus on allergy and autoimmune conditions.

LOCOMOTIVE SYSTEM

*Introduction to basic clinical and therapeutical concepts of the most common orthopaedic pathologies in the pediatric age. Recognition of the most common skeletal deformities during growth period.*

CHILD NEUROLOGY

*Fundamental and indispensable objectives are the following:*

- *To acquire precise scientific knowledge necessary to classify and correctly define the pediatric neurological diseases most frequently encountered in the clinical setting.*
- *Comprehension of the main pathophysiological mechanisms responsible of the neurological deficit and specific in children.*
- *Clinical approach to child affected by neurological diseases most encountered in rehabilitation clinical setting.*

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**LEARNING OUTCOMES**

APPLIED TECHNICAL AND MEDICAL SCIENCES

**Knowledge and understanding**
At the end of the course, the student must know / be able to:

- the technologies, equipment (and its components), dedicated instrumentation and diagnostic techniques used in the field of diagnostic imaging;
- the principles and methods of correct functioning of the same and the criteria of correctness of the techniques performed;
- how to provide services according to the most common diagnostic / therapeutic protocols
- the main aspects of radiation protection;
- every aspect and measure suitable for pediatric patients;
- Illustrate the knowledge acquired and know how to apply them from an operational aspect.

**Applying knowledge and understanding**
At the end of the course, the student must be able to use:

- knowingly equipments and methodologies, in order to provide the services correctly, in compliance with the radioprotection and safety principles, as well as in compliance with clinical risk policies;
- the knowledge acquired for the autonomous study of aspects relating to the specific field to which the student will dedicate himself in the context of his professional activity;

**Communication skills**
At the end of the course, the student must be able to:

- Know, in an adequate way, the terminology and the related scientific aspects specific to the discipline of diagnostic imaging;
- apply their knowledge and skills to the professional context, in order to communicate effectively with:
  a) the pediatric patient and the accompanying persons, in order to obtain the best collaboration, provide all indications and information as well as the precautions and radiation protection aspects;
  b) the team he works with, coordinating and collaborating correctly and proposing a timely, critical, proactive and resolving analysis of inconveniences and problems

**Making judgements**
At the end of the course, the student must know:

- carry out general assessments relating to the topics covered

GENERAL AND SPECIALIZED PEDIATRICS

**Knowledge and understanding**
*At the end of the course, the student will have to be able to:*
1.Know the inspiring principles of health protection of patients in the evolutionary age
2.Know the organization of hospital levels of perinatal care

3.Know the organization of health professionists team, engaged in support of newborn-mother dyad
4.Know how to classify a newborn on the basis of weight and gestational age
5.Know the steps of perinatal care of physiologic, pathologic and preterm newborn in the delivery room
6.Know how to define and classify neonatal asphyxia
7.Know the basics of most important pathologies of preterm newborn
8. Know the principles and basics of neonatal infections
9. Know the principles and basics of neonatal hematology
10. Know the promotion strategies of breastfeeding
11. Know the basic diagnostic tools of exanthematous diseases in paediatric age
12. Know the vaccinations timetable, according to Italian law
13. Know how to organize a weaning schedule
14. Know the main steps of puberal development
15. Know basic notions of respiratory disease in pediatric age
16. Know basic notions of gastroenterological pathology in pediatric age
17. Know the main accidents and injuries of the developmental age and define their preventive strategies
18. Have basic notions of rheumatological pathology in pediatric age
19. Have basic notions of allergic pathology in pediatric age

GENERAL AND SPECIALIZED PEDIATRICS

**Applying knowledge and understanding**
*At the end of the course, the student will be able to:*
➢ Use the acquired knowledge for further and individual deepening of specific issues related to professional future activity

**Communication skills**
*At the end of the course, the student will have to:*
➢ To be able to speak using scientific terminology, properly and appropriately.

**Making judgements**
*At the end of the course, the student will have to be able to:*
➢ Make general evaluations and judgements concerning treated issues and topics

**Knowledge and understanding**
*At the end of the course, the student will have to be able to carry out main learning in new and concreate situations and evaluate the optimal clinical and diagnostic stepwise process. Particularly the student will be able to:*
1.Know the inspiring principles of health protection of patients in the growing age
2. Know the basics of the most important pediatric respiratory tract diseases
3. Know the basic principles of allergic diseases pathogenesis, clinical manifestations and management, with special focus on more serious conditions such as asthma and anaphylaxis.
4. Know the basic diagnostic tools of exanthematous diseases in pediatric age
5. Know the vaccinations timetable, according to Italian law and the principles of maternal immunization
6. Know the main differential diagnosis of recurrent infections in pediatric age
7. Know the basic principles of the main autoimmune conditions such as coeliac disease and inflammatory bowel diseases (IBD)

**Applying knowledge and understanding**
*At the end of the course, the student will be able to:*
➢ Use the acquired knowledge for further and individual deepening of specific issues related to future career

**Communication skills**
*At the end of the course, the student will have to:*
➢ To be able to speak using scientific terminology, properly and appropriately.

**Making judgements**
*At the end of the course, the student will have to be able to:*
➢ Make general evaluations and judgements concerning treated issues and topics

LOCOMOTIVE SYSTEM

## Knowledge and understanding
- *At the end of this teaching the student will need:*
  - *to know the pathologies of pediatric orthopedics described;*
  - *to know the clinical and instrumental diagnostic criteria;*
  - *to know the most commonly used treatment options;*

***Applying knowledge and understanding***
*Al termine dell'insegnamento lo studente sarà in grado di:*
*Utilizzare le conoscenze acquisite per l'approfondimento autonomo di aspetti relativi al campo specifico al quale lo studente si dedicherà nell'ambito della attività professionale;*

**Communication skills**
*At the end of the course the student will be able to:*
- *Use the knowledge acquired to independently investigate the aspects related to the specific field in which the student will be involved in his professional activity*

CHILD NEUROLOGY

***Knowledge and understanding***
*At the end of this course the student will acquire:*
- *Basic knowledge of the "functional" anatomy of the cranio-cerebral system.*
- *Ability to classify and distinguish the different types of pediatric neurological diseases and their rehabilitative impact.*

***Appling knowledge and understanding.***
*At the end of this course the student will be able to:*
- *Apply the acquired notions to correctly identify and define a neurological impairment or a determined outcome, go back to the origin, know its natural history and understand the specific pediatric context.*
- *Dispose of a sufficient body of knowledge to allow further autonomous deepening on more specific subjects included in the vast world of neuro-rehabilitation.*

***Communication skills.***

*At the end of this course the student will be able to:*

- *Use technical and proper terminology to describe any common neurosurgical scenario. To correctly describe the pathophysiology and the mechanism generating the disease.*

***Making judgment.***

*At the end of this course the student will be able to:*

- *Correctly pursue a general assessment concerning the anatomical, physiological and clinical aspects of a certain child neurological condition and to predict a possible prognosis.*

**COURSE SYLLABUS**

APPLIED TECHNICAL AND MEDICAL SCIENCES

1. Introduction to radiodiagnostic imaging: general information and definition of investigation techniques;
2. Organization of a diagnostic department for images and pediatric aspects;
3. Radiation protection, legal and medico-legal aspects, current legislation regarding protection from ionizing radiation;
4. Traditional radiology, contrast and digital radiological techniques
5. Tomographic technologies: CT and MRI
6. Nuclear medicine and molecular imaging
7. Interventional radiology
8. Ultrasound
9. Image processing (RIS / PACS) and Post processing
10. Emergency / urgent radiographic investigations;
11. Correctness criteria in the execution of a radiolgraphic study;
12. Diagnostic imaging in the main pathologies of pediatric and developmental age: examples and experiences

GENERAL AND SPECIALIZED PEDIATRICS

Introduction to Pediatrics: neonatal and pediatric age – pediatric and neonatal training of health professionist – prenatal development and adaptations to extrauterine life – classification of newborn: weight, gestational age, growth curves -newborn care in Delivery Room; Apgar score – first care of the newborn infant – neonatal resuscitation: respiratory, circulatory and metabolic - prenatal infections, TORCH diseases ; prevention of neonatal congenital infections – postnatal early and late infections: sepsis and meningitis – bilirubin metabolism: neonatal physiologic and pathologic jaundice – psychomotor development of the child; weaning and feeding in pediatric ages –

Auxology: short stature and GH deficiency; endocrinology: puberty: physiological phenomena; early and late puberty - Fever and infectious diseases: measles, rubella, chicken pox, epidemic parotitis, infectious mononucleosis, whooping cough; pharyngotonsillitis and post-streptococcal pathologies; meningitis and encephalitis, vaccination calendar - Gastro-enteric pathology: gastro-oesophageal reflux, celiac disease, gastroenteric functional disorders, enteritis; respiratory pathology: otitis media, laryngitis, epiglottitis, bronchiolitis, polmonitis, asthma; fibrosis cystic.

Rheumatology: general overview of arthritis, m. rheumatic, juvenile idiopathic arthritis, Schonlein-Henoch disease, Kawasaki disease;

Allergic Diseases and Anaphylaxis - Accidents and injuries in the pediatric age; classification and prevention strategies .

LOCOMOTIVE SYSTEM

- *Biological and physiological principles of the locomotive system*
- *Congenital pathologies of the bone*
- *Skeletal deformities*
- *Infective diseases of the locomotive system*
- *Typical pedriatic fractures*

CHILD NEUROLOGY

***Clinical Approach in Child Neurology***

- *The consultation*
- *History taking*
- *Neurological Examination*
- *Higher cognitive function*
- *Cranial nerves*
- *Peripheral nervous system*
- *Neonatal neurological examination*

***Neurodiagnostic tools***

- *Principles of neuroradiology*
- *Principles of neurophysiology*
- *Laboratory tests*
- *Lumbar Pucture*
- *Neuropsychological testing*

***1) Signs & Symptoms***

- *Agitation and confusion*
- *Sleepiness*
- *Developmental impairment*
- *Excercise limitations and muscle pain*
- *Floppy infant*
- *Foot deformities*
- *Gait abnormalities*
- *Headache and and head abnormalities*
- *Speech difficulties*
- *Acquired brain/spinal cord injury*
- *Autoimmune diseases*
- *Epilepsy*
- *Migraine*
- *Infection of CNS*
- *Sleep disorders*
- *Neuromuscular diseases;*
- *Neuropediatric Emergencies:*
    - *Coma*
    - *status epilepticus;*

- *acute motor symptoms*

**COURSE STRUCTURE**

APPLIED TECHNICAL AND MEDICAL SCIENCES
The teaching module, lasting 20 hours, (2CFU) is integrated, according to the defined study plan. It is mainly carried out according to frontal teaching with an average duration of 2 hours (4 or 5), in the manner (eg presence or remotely) established by the university organization and in compliance with applicable legislation and / or recommendations on the subject. In addition to the lectures, workshops, exercises, group work and educational visits may be provided. In order to involve the student and improve learning, the teaching method may include the resolution of some practical questions, the answer to some cognitive questionnaires, the preparation of thematic papers or research and / or bibliographic research.

GENERAL AND SPECIALIZED PEDIATRICS
The course is organized in 20 hours of frontal lessons, divided into 2 or 3 hours on the basis of Accademic year's timetable. Students will be free of doing verbal interventions during the lessons, in order to deal with one another and stimulate discussion in the group

LOCOMOTIVE SYSTEM
*The teaching is structured in 10 hours of frontal teaching, divided into lessons of 2 or 3 hours according to the academic calendar.*

CHILD NEUROLOGY
*The course provides a total of 20 hours of frontal lessons divided in five 4h-lessons. Frontal teaching will include slides and clips projection, followed by interactive discussion of clinical cases related to the lesson topic.*

**COURSE GRADE DETERMINATION**

APPLIED TECHNICAL AND MEDICAL SCIENCES
The verification of the preparation of the students will take place through an oral test. During the oral examination the Examining Commission will assess the ability of the Student to apply the knowledge and will ensure that the skills are adequate to support and solve problems of a rheumatological nature. The following will also be assessed: making judgments, communication skills (communication skills) and learning skills (learning skills) as indicated in the Dublin descriptors.

GENERAL AND SPECIALIZED PEDIATRICS
The student grade of knowledge will be verified by a written and /ororal exam ; the minum grade to successfully pass the exam is 18/30. The written test will consist of 30 questions with multiple choice answers, for each correct answer a point will be assigned. The final score of the written test will be given by the sum of the partial scores assigned to each question answered correctly. The student must have totaled at least a minimum of 18 points to successfuly pass the exam. .

LOCOMOTIVE SYSTEM

*The student's knowledge will be evaluated through a multiple choice written exam.*
*The exam will have 30 questions with 4 possible answers per question; 1 answer correct only. Each correct answer is worth 1 point for a total of 30 points available. 18 points will be necessary in order to pass the exam.*
*Possibly, there might be some questions that need an open answer to justify the answer to a previous question. This type of answer is also worth 1 point.*

## OPTIONAL ACTIVITIES

GENERAL AND SPECIALIZED PEDIATRICS

In addition to frontal theoric lessons, the student will have the opportunity to attend seminars and ward activities in Pediatric and Neonatal Units of Castelli Hospital.

LOCOMOTIVE SYSTEM

*No additional activities are provided*

CHILD NEUROLOGY

*Besides the frontal didactics, opportunities to focus and expand any topics will be granted to the student, in an extra-time setting. This supplemental activity should be discussed in advance with the teacher. The issues reviewed in these sessions will not be considered examination matter.*

## READING MATERIALS

APPLIED TECHNICAL AND MEDICAL SCIENCES

- Imaging in Pediatrics - **Authors:** A. Carlson Merrow, Jr. Selena Hariharan – publisher Elsevier 2017 https://www.elsevier.com/books/T/A/9780323477789 [with italian version]
- Caffey's Pediatric Diagnostic Imaging – Authors: Coley, Brian D – publisher Elsevier
- Imaging for Pediatricians: 100 Key Cases – Authors: María I. Martínez-León, Antonio Martínez-Valverde, Luisa Ceres-Ruiz, publisher Springer

- consultation of journals and scientific articles / papers and online resources:
  - for example: Pediatric Radiology, publisher Spinger https://www.springer.com/journal/247

- consultation of documents and free resources produced by the European scientific societies of radiology, nuclear medicine, radiotherapy Guidelines & Recommendations
  - for example:
    European Society of Radiology
    https://www.myesr.org/publications/guidelines-and-recommendations,
    European Association of Nuclear Medicine (EANM)

https://www.eanm.org/publications/technologists-guide/

GENERAL AND SPECIALIZED PEDIATRICS

- Cloherty and Stark's Manual of Neonatal Care , by Anne R. Hansen, Eric C. Eichenwald, Ann R. Stark , Camilia R. Martin – Lippincott Manual, November 23, 2016

- The Washington Manual of Pediatrics, by Andrew J White - Lippincott Manual; February 11, 2016

- Nelson Nelson Essentials of Pediatrics by Kliegman Robert M., Marcdante Karen; 8° edition; 2019

LOCOMOTIVE SYSTEM

Pedriatic Orthopedic Deformities: Basic Science, Diagnosis and Treatment; F.Shapiro 2001 Elsevier E-Book

CHILD NEUROLOGY

*Pediatric Neurology 3rd Edition.* Ed. Oxford University. Oxford: 2017. ISBN: 978019960363-3

*Fenichel's Clinical Pediatric Neurology* 8th Edition 2019 A Signs and Symptoms Approach Ed. Elsevier. ISBN 9780323496858

*During each lesson the teacher will support the student with an abundant source of references, indicating the most important and recent literature to read. Fundamental Book Chapters will be also provided, directly by the teacher.*

*Pediatric Neurology 3rd Edition. Ed. Oxford University. Oxford: 2017. ISBN: 978019960363-3*

*Fenichel's Clinical Pediatric Neurology 8th Edition 2019 A Signs and Symptoms Approach Ed. Elsevier. ISBN 9780323496858*