



## **Faculty of Rehabilitation**

Tehran University of Medical Sciences & Health Services  
Enghelab Street, Pich-e-Shemiran

Tehran – IRAN Po.Box 15875-4391

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### **Course Description**

**Islamic Republic of Iran**



**Ministry of Health, Treatment & Medical Education**



**Tehran University of Medical Sciences & Health Services**

**School of Rehabilitation**

**Master's Degree, Physical Therapy Program**

**2014**  
Revised

# **Course Description Guide**



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### Course Description

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### **Course Description**

#### **Introduction**

Regarding vast capability of physical therapy, many services in rehabilitation, clinical application and extended progression in new equipments and techniques, graduate program of physical therapy is designed. Increasing demand to leading physical therapist because of expanding industrialized life, diseases, natural disasters, accidents, war and lack of graduated physical therapist in the society are other reasons for designing this program.

#### **1) Definition and Goals**

Master course of physical therapy is one of the advanced courses in clinical and rehabilitation sciences. The therapist will train for different activities in the field of physical therapy, and the goals are as follows:

- A) Research activities that provide scientific view in their practice
- B) Familiarity with the new methods, equipments and techniques in prevention, evaluation and treatment in the field
- C) Obtaining required abilities for presenting education service

#### **2) Duration of the degree and system**

The duration of the master degree in physical therapy is at least 2 years. The form of education system is according to educational regulation of universities and higher education approved by high council of programming.

Courses are presented in theoretical, practical and theoretical-practical formats.



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#### **3) Number of credits and classification**

The minimum number of credits during master degree of physical therapy is 32. These include a minimum of 8 credits of optional courses (Non Core), 18 credits of compulsory courses (Core) and 6 credits for research thesis which must be complete based on a scientific investigation by the student.

According to the option of the department, the students may have to pass Medical Information Technology (1 credit) and Special English Language (2 credit), too.

#### **4) Special qualifications**

1- Holding bachelor degree in physical therapy  
2- Passing successfully the entrance examination which will be held by the ministry of health, treatment & medical education once a year, the items are followed:

- A- NeuroAnatomy and anatomy (osteology, limbs, head, neck & trunk,)
- B- Kinsiology and Biomechanics(I, II and III- multiply 2)
- C-Physical therapy in musculoskeletal, cardiopulmonary, surgical, neurological conditions and internal diseases(I and II, cardiopulmonary, skin and rheumathologic) (multiply 3)
- D- Measurement and evaluation (muscle testing) (multiply 1)
- E-Electrotherapy (I and II- multiply 2)
- F-Orthetics prosthetics and assistive device(multiply 1)
- G-Therapeutic exercises (I, II and III- multiply 3)
- H-General English (multiply 2)



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### Course Description

#### Table of compensatory Courses

Code	Course Title	Credit(s)			Hour(s)			Prerequisite
		The.	Prac.	Total	The.	Prac.	Total	
01	Medical Information Technology	1	0.5	0.5	9	17	26	
02	English Language for Physiotherapists	2	2	-	34	-	34	
Total		3	2.5	0.5	43	17	60	

Each M.Sc. student has to choose the credits by the agreement of physical therapy department and the endorsement of the university council.

#### Table of Compulsory Courses

Code	Course Title	Prerequisite	Credit(s)				Hour(s)		
			The.	Prac.	Clinical Training	Total	The.	Prac.	Total
03	Advanced Bio Statistics		1	1		2	17	34	51
04	Research Methodology		2	0		2	34	0	34
05	Evidence-based physiotherapy		2			2	34		34
06	Electro-noro-myography	12	3	3		6	51	102	153
07	Instrumentation			1		1		34	34
08	Clinical training				3	3		153	153
09	Seminar		1	0		1	17	0	17
10	Project	09	-	1		1	-	-	34
11	Thesis	09, 10	-	6		6	-	-	-
Total			9	12	3	24	153	357	510

Choosing all compulsory courses is necessary.



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### Course Description

Table of Optional Courses

Code	Course Title	Prerequisite	Credit(s)			Hour(s)		
			Theo.	Prac	Total	Theo	Prac.	Total
12	Neuromuscular Physiology and Pathophysiology		2		2	34		34
13	Biomechanics of Gait and Upper and Lower limbs Musculoskeletal Injuries		2	-	2	34		34
14	Biomechanics of Musculoskeletal Injuries(Vertebral Column)		2	0	2	34	0	34
15	Mobilization	14	1	1	2	17	34	51
16	Central Nervous System Electrophysiology		2		2	34		34
17	Motor Control	12	2		2	34		34
18	Advanced Special Techniques	12	2		2	34		34
19	Cardiovasculo-pulmonary Pathophysiology		2		2	34		34
20	Work (Exercise) Physiology		2		2	34		34
21	Cardiopulmonary Physiotherapy	19	2	1	3	34	34	68
22	Paraclinical Diagnosis of Cardiovasculo-pulmonary Diseases	19	1	1	2	17	34	51
Total			20	3	23	340	102	442

Each M.Sc. student has to choose at least eight credits of above courses by the agreement of physical therapy department and her/his supervisor.



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### Course Description

Course Title: Advanced Bio Statistics

Course Number: 2171695

Course Code: 12

Course Type:  Compulsory

Prerequisite Title(s): Bio Statistics

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	Theo.	Prac.	Total
Credit(s):	1	1	2
Hour(s):	17	34	51

---

Research statistic and advance statistical processes including interclass correlation simple linear regression, multiple regression and multivariate analysis of variance, hypothesis testing, principal of questionnaire design, interview techniques, data collection, analysis and interpretation of findings and using the standard statistical software such as SPSS are some of the subjects of this course.



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### Course Description

Course Title: Biomechanics of Gait and Upper and Lower limbs Musculoskeletal Injuries

Course Number: 2178284

Course Code: 08

Course Type:  Optional

Prerequisite Title(s): None

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	Theo.	Prac.	Total
Credit(s):	2	-	2
Hour(s):	34	-	34

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This course is designed for observation, description, assessments and analysis normal and abnormal posture, balance and gait in the normal and person with musculoskeletal, neural diseases and conditions from childhood to elderly as well as pathological patterns in aforementioned groups and correcting these patterns (gait & balance training and rehabilitation).

Biomechanics of equilibrium in standing and sequences of gait, effects of vestibular, proprioception, visual and musculoskeletal systems on them are widely discussed.

In the laboratory student will be familiar with the automated equilibrium and motion analyzer and force platform. In addition, this course address architecture, function and biomechanics of musculoskeletal system of upper and lower extremities including bone, cartilage, ligament, tendon, and muscle tissue in various setting and activities, exercises and injuries and healing process in this system.

Emphasis will be on analysis of the force, biomechanics and mechanism of injuries in hip, knee, ankle joints, and shoulder, elbow, arm, wrist and hand joints and muscles as well as biomechanics of fixation and body mechanic and ergonomics. The effect of physical therapy interventions is also discussed.

Course format includes lectures and discussion of original research papers.





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### Course Description

Course Title: Biomechanics of Musculoskeletal Injuries (Vertebral Column)

Course Number: 2178266

Course Code: 04

Course Type:  Optional

Prerequisite Title(s): None

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	Theo.	Prac.	Total
Credit(s):	2	0	2
Hour(s):	34	0	34

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This course address architecture, function and biomechanics of musculoskeletal system including bone, cartilage, ligament, tendon, and muscle tissue in various setting and activities and injuries as well as healing process in this system and body mechanic and ergonomics.

Analysis and evaluation of the force, biomechanics and mechanism of injuries in cervical, thoracic and lumbosacral vertebral column, their tissues, joints and muscles will be emphasized.

The effect of physical therapy interventions is also discussed.

Course format includes lectures and discussion of original research papers.



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### Course Description

Course Title: Centran Nervous System Electrophysiology

Course Number:

Course Code: 10

Course Type:  Optional

Prerequisite Title(s): None

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	Theo.	Prac.	Total
Credit(s):	2	0	2
Hour(s):	34	-	34

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This course includes study of theories and principle of electromyography, nerve conduction and electro diagnosis(NCS), integrating electrophysiological concepts in normal and pathologic situations and electromyographic cahnges in erdely in order to evaluate nerve and muscle pathology and reflexes.

It is also consist basic methodology techniques, protocols related kinsiological, and functional EMG.

Course format includes lectures and discussion of original research papers.



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### Course Description

Course Title: Electro-neuro-myography

Course Number: 2178334

Course Code: 10A

Course Type:  Compulsory

Prerequisite Title(s): Electromyography

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	Theo.	Prac.	Total
Credit(s):	3	3	6
Hour(s):	51	102	153

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Applied electro diagnosis methods, NCV, kinesiological functional EMG and gait analysis EMG in laboratory and clinic are included in this course.

In addition, study of electrophysiological effects of electrotherapeutic modalities, exercise and relaxation in normal and pathologic muscle fibers as well as normal and pathologic nervous system (CNS and PNS diseases and injuries) are other parts of this course.



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### Course Description

Course Title: Medical Information Technology

Course Number:

Course Code: 07

Course Type:  Optional

Prerequisite Title(s): None

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	Theo.	Prac.	Total
Credit(s):	0.5	0.5	1
Hour(s):	9	17	26

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In this course, the student will be familiar with the basic concepts of computer, algorithm and information technology, operation systems such as Dos & windows and medical information banks (Medline), in the laboratory they put into practice what they have learnt theoretically.



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### Course Description

Course Title: Mobilization  
Course Number: 2178533  
Course Type:  Optional  
Course Code: 06  
Prerequisite Title(s): None

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	Theo.	Prac.	Total
Credit(s):	1	1	2
Hour(s):	17	34	51

---

This course includes assessment and treatment of upper & lower extremities and vertebral column problems. It is based on various mobilization, manipulation and muscle energy techniques for treating soft tissue and joint dysfunction and pain syndrome.

A theoretical education followed by systematic demonstration and supervised laboratory and treatment practice at the clinic.



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### Course Description

Course Title: Neuromuscular Physiology and Pathophysiology

Course Number: 2178316

Course Code:11

Course Type:  Optional

Prerequisite Title(s): None

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	Theo.	Prac.	Total
Credit(s):	2	0	2
Hour(s):	34	0	34

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In depth study of physiological responses to diseases associated with neuromuscular system including physiology and histochemistry of intact nervous and muscular system including child and elderly as well as responses of these systems to diseases and injuries.

The students learn to recognize the clinical pictures of nervous pathologies and make decision appropriately for physical therapy intervention.

Course format includes lectures and discussion of original research papers.



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### Course Description

Course Title: Work (Exercise) Physiology

Course Number: 2178230

Course Code: 05

Course Type:  Optional

Prerequisite Title(s): None

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	Theo.	Prac.	Total
Credit(s):	2	-	2
Hour(s):	34	34	34

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This course is designed to provide the knowledge of physiologic and metabolic effects of exercise (physical activity) on body systems including cardio pulmonary, neurological, musculoskeletal, digestive, endocrine and urogenital system in healthy individuals(athletics, children, men, women) as well as individuals with disease and special needs(such as elderly).

The student will be familiar with variety of laboratory techniques and tests such as cardiopulmonary and stress test that can be utilized for designing appropriate exercise program.

Effects of physical characteristic, diet and nutrition and medication such as sedated drugs on exercise is discussed in this topic.



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### Course Description

Course Title: Project

Course Number: 2178560

Course code: 14

Course Type:  Compulsory

Prerequisite Title(s): Advance Bio Statistics and Research Methodology

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	Theo.	Prac.	Total
Credit(s):	0	1	1
Hour(s):	0	34	-

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This course is designed to enable students to investigate independently a problem/topic related to physical therapy and guide and prepare them to complete their master thesis. Students will have this opportunity to perform and complete their project and put into practice what they have learnt in previous courses under supervision and guidance of a faculty member/research advisor.

Focus will be on review of literature, methodology, data collection & analysis and reporting result in scientific format.

The result is presented in written and oral format to the faculty and peers at the final week of the semester and will be critically reviewed. A faculty member screens both the written report and presentation.





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### Course Description

Course Title: Research Methodology

Course Number: 2174222

Course Code: 13

Course Type:  Compulsory

Prerequisite Title(s): None

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	Theo.	Prac.	Total
Credit(s):	2	0	2
Hour(s):	34	0	34

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This course covers, all aspects of research including: research selection, statement of the problem, hypothesis generation, review of literature, methodology, ethic of research, subject selection, budget, non-experimental designs including both qualitative and quantitative methods, pilot study, data collection, measurement & sampling, analysis and formulate conclusions.

It gives knowledge to students to design, develop and perform a research in the allied health sciences, specifically, physical therapy and review and analysis professional literature.

Students write a clinical research proposal in physical therapy following standards.

Course format includes lectures and discussion.



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### Course Description

Course Title: Seminar

Course Number: 2178397

Course Code: 15

Course Type:  Compulsory

Prerequisite Title(s): None

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	Theo.	Prac.	Total
Credit(s):	1	0	1
Hour(s):	17	0	17

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This course is designed to provide opportunity to explore and discuss major topic areas in physical therapy professions such as biomedical ethics, professional practice standards and regulation, basic management skills, interdisciplinary practice and interpersonal communication skills for the health care environment and other current and relevant issues of the profession.

Also lecture guest speakers and M.Sc. students share their experience and knowledge in topics such as burn and wound care, hand therapy and other clinical skills in panel discussion (sessions).



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### Course Description

Course Title: Thesis

Course Number: 2178524

Course Code: 16

Course Type:  Compulsory

Prerequisite Title(s): Advance Bio Statistics, Research Methodology and Project

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	Theo.	Prac.	Total
Credit(s):	0	6	6
Hour(s):	0	34	-

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The degree must be obtained by thesis research.

Students will design, perform and complete their own research under supervision of supervisor and advisor (statistic/research advisor).

A pilot study will be done by the student (it could be the project course) then proposal of the thesis must be defend by student and approved by postgraduate studies' committee of Faculty.

After completing of research, and approving by the supervisor, thesis, which is written in scientific format and consist of formulation of problem, literature review, materials & methods, procedure for collecting data, data analysis, results, conclusion and discussion, will be given to referees as internal and external scientific staves.

At the defense session in the presence of External (s), Internals, advisor, supervisor, the postgraduate committee and other faculty members and peers, student delivers his/her thesis and respond to questions and critiques.

The course grade will be assigned on the basis of evaluations from referees and the committee.



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### Course Description

Course Title: English Language for Physiotherapists

Course Number:

Course Code:

Course Type:  Optional

Prerequisite Title(s): None

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	Theo.	Prac.	Total
Credit(s):	2	0	2
Hour(s):	34	0	34

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Most of the reference books of Physiotherapy have been written in English. Therefore it is necessary for physiotherapist students to be familiar with this language and its application in physiotherapy. Also, they must read and understand the methods of assessment, treatment, ... in textbooks of physiotherapy.



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### Course Description

Course Title: Evidence-Based Physiotherapy

Course Number:

Course Code:

Course Type:  Compulsory

Prerequisite Title(s): None

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	Theo.	Prac.	Total
Credit(s):	2	0	2
Hour(s):	34	0	34

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#### Course description:

According to increasing trend of information, it seems necessary to classify these information according to evidences. The students should be able to analysis, formulate and respond to a special question related to various fields of clinical physiotherapy.

#### General Objective of the course:

The purpose of this course is to provide the students opportunities to familiarized with the evidence based physiotherapy and how to collect the evidences.

#### Course syllabus:

Definition and foundations of evidence based physiotherapy and introducing the guidelines of the methods of physiotherapy.



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### Course Description

Course Title: Instrumentation

Course Number:

Course Code:

Course Type:  Compulsory

Prerequisite Title(s): None

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	Theo.	Prac.	Total
Credit(s):	1	0	1
Hour(s):	0	0	34

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The students will be familiar with the various research devices, including Forceplate, EMG apparatuses, Isokinetic dynamometry, Biofeedback etc. They learn to use these devices for research in physiotherapeutic fields and how to quantify the prescribed treatments for their patients.



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### Course Description

Course Title: Clinical Training

Course Number:

Course Code:

Course Type:  Compulsory

Prerequisite Title(s): None

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	Theo.	Prac.	Training	Total
Credit(s):	0	0	3	1
Hour(s):	0	0	153	153

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At the end of this course, the students will be able to use the acquired theoretical knowledges as applied in clinics for various orthopaedic, neurologic and cardiopulmonary patients. They should be able to perform an precise assessment and treatments for these patients, and then evaluate their treatments.



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### Course Description

Course Title: Motor Control

Course Number:

Course Code:

Course Type:  Optional

Prerequisite Title(s): None

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	Theo.	Prac.	Total
Credit(s):	2	0	2
Hour(s):	34	0	34

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The aim of the present course is to familiar with the general principle of motor control and motor learning in human, and how they used the related theories and principles for treating the patients with movement and posture disfunctions.





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### Course Description

Course Title: Advanced Special techniques

Course Number:

Course Code:

Course Type:  Compulsory

Prerequisite Title(s): None

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	Theo.	Prac.	Total
Credit(s):	2	0	2
Hour(s):	34	0	34

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The students will be familiar with the basic principles and methods of treatments of neurologic patients, particularly cerebrovascular accident patients. They learn the mechanisms of injury of the nervous system and new methods of physiotherapy in rehabilitation of the patients.



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### Course Description

Course Title: Cardiovasculo-pulmonary Pathophysiology

Course Number:

Course Code:

Course Type:  Optional

Prerequisite Title(s): None

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	Theo.	Prac.	Total
Credit(s):	2	0	2
Hour(s):	34	0	34

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The aim of the present course is to familiar with the basic physiology of heart, vascular circulation, etiology, pathophysiology, and treatment of the prevalent diseases of cardiovascular and respiratory systems. They will be familiar with the anatomy and physiology of the related systems.



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### Course Description

Course Title: Cardiopulmonary Physiotherapy

Course Number:

Course Code:

Course Type:  Optional

Prerequisite Title(s): None

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	Theo.	Prac.	Total
Credit(s):	2	1	3
Hour(s):	34	34	68

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The aim of the present course for physiotherapists is to be familiar with the therapeutic methods for cardiac patients, before and after the surgery, and pulmonary diseases. They will be learnt how to rehabilitate a cardiopulmonary patients in different phases of rehabilitation. They learn the risk factors, indications and counterindications of the exercises for these patients.



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### Course Description

Course Title: Paraclinical Diagnosis of Cardiovasculo-pulmonary Diseases

Course Number:

Course Code:

Course Type:  Optional

Prerequisite Title(s): None

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	Theo.	Prac.	Total
Credit(s):	1	1	2
Hour(s):	17	34	51

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The physiotherapists should be able to have an interpretation of results of paraclinic examination in Cardiovasculo-pulmonary Diseases. They will be familiar with the tests of Exercise physiology, Electrocardiography, Echocardiography, Diagnostic Ultrasonography, Angiography, Cardiopulmonary CT etc.