



Faculty of Rehabilitation

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

Tel: +98 21 77530670

Tehran – IRAN Po.Box

Fax:

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, Sports Physical Therapy Program

2014

Course Description Guide



Faculty of Rehabilitation

Tehran University of Medical Sciences & Health Services

Enghelab Street, Pich-e-Shemiran

Tehran – IRAN Po.Box

Fax:

Tel: +98 21 77530670

Course Description

| Contents..... | Page Number |
|---|--------------------|
| Name, Definition and Goals..... | 3 |
| History..... | 3 |
| Values..... | 3 |
| Mission..... | 4 |
| Vision..... | 4 |
| Aims..... | 4 |
| Role definition..... | 5 |
| Task analysis..... | 5 |
| Educational strategies..... | 5 |
| Special qualifications and application conditions..... | 5 |
| Similar fields in our country..... | 6 |
| History in other countries..... | 6 |
| Requirements to held..... | 6 |
| Duration of the curriculum..... | 6 |
| Compensatory Courses..... | 8 |
| Compulsory Courses (Core)..... | 9 |
| Optional Courses (Non core)..... | 10 |
| Course Title: Advanced Bio Statistics and research Methodology..... | 11 |
| Course Title: Sports Biomechanics (1)..... | 13 |
| Course Title: Sports Biomechanics (2)..... | 15 |
| Course Title: Exercise Physiology..... | 17 |
| Course Title: Electromyography..... | 19 |
| Course Title: Medical Information Technology..... | 21 |
| Course Title: Sports Nutrition..... | 23 |
| Course Title: Sports injuries (1)..... | 25 |
| Course Title: Sports injuries (2)..... | 28 |
| Course Title: Seminar..... | 30 |
| Course Title: Thesis..... | 31 |
| Course Title: Advanced Electromyography..... | 32 |
| Course Title: Physiologic Basis of Therapeutic Exercise..... | 34 |
| Course Title: Physiotherapy for sports Injuries (1)..... | 36 |
| Course Title: Physiotherapy for sports Injuries (2)..... | 38 |
| Course Title: Clinical Practice for sports injuries..... | 40 |
| Course Title: Cardiovasculo-pulmonary Physiology..... | 42 |
| Course Title: Advanced muscle and nerve neurophysiology..... | 44 |
| Course Title: Advanced Analysis of Sports Activities..... | 46 |



Faculty of Rehabilitation

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

Tel: +98 21 77530670

Tehran – IRAN Po.Box

Fax:

Course Description

1. Name, Definition and Goals

Master course of sports physical therapy consists of research and theoretical and practical educations. The students are familiarized with the factors that affect on the athletes function during sports activities. Also, they perform related research that promote sports and health level for all the population.

This branch of physiotherapy, considers the assessment and treatment of sports related injuries.

2. History

Increasing interest for physical exercises may increase the risk of sports injuries. But, the presence of uninformed coaches in sports clubs and performing faulty movements lead to severe injuries. Thus, relevant specialists are necessary for treatment and training to correct movements. Unfortunately, experimental sports coaches perform these actions due to the lack of related specialists. Recently, the ministry of health has started to train specialists in this field as sports physiotherapists because of extensive sports fields, physical education clubs, sports at schools and universities to help the assessment, treatment or prevention of the sports and exercise injuries.

The sports physiotherapy alumni offer necessary services to society according to their knowledge of the kinesiology and biomechanics, various diseases, new physical therapy techniques, The educational program has been provided considering the related programs of various countries, including the USA, Russia, England, France, Canada, Australia, Swedish, Italy, Brazil, Japan, India, Turkey, Pakistan... .

3. Values:

All medical branches are valuable since they help patients. The development of sports physiotherapy promotes physical and psychological health, improves sedentary problems, improves faulty posture and movement of the people, decreases the tensions, prevents the cardiovascular diseases and... . Also, training the qualified specialists, prevents injuries due to the interference of non-professionals. Raising the level of preparedness of the professional athletes, the honors of the society, to participate in competitions and return to sports functions is a great honor.



Faculty of Rehabilitation

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

Tel: +98 21 77530670

Tehran – IRAN Po.Box

Fax:

Course Description

4. Mission:

The lack of physical movements, software, games and industrialization have led to the neck and low back pain, spinal deformities (scoliosis, lordosis, kyphosis) in particular in girl students, and many other problems from childhood and adolescence. Overweight, diabetes type II and psychological problems are increasingly observed.

In the other hand, the subject of sports and exercise have increasingly extended in all ages. Increasing interest for physical exercises may increase the risk of sports injuries. But, the presence of uninformed coaches in sports clubs and performing faulty movements lead to severe injuries. Thus, relevant specialists are necessary for treatment and training to correct movements.

Exercise is considered not only in health but in politics international subjects. Thus, training the related specialists for treatment and prevention of sports injuries is an important issue. The presence of sports physiotherapist in the team therefore is necessary. Sports related injuries may remain always untreated due to the lack of sports physiotherapist. Sports injury prevention and education of corrective movements, even after surgery, is the other responsibility of the specialists.

5. Vision

In spite of many advances in sports physiotherapy and rehabilitation, there is some shortage in this field. Postgraduate levels (Msc and PhD) in sports physiotherapy may fill these gaps and extend knowledge territory. At the beginning, the master degree and in the future, PhD degree will be developed for these purposes.

The presence of sports physiotherapist in the sports clubs therefore is necessary for amateurs, recreationally active and professionals, for treatment and prevention of sports related injuries.

6. Aims

- Improvement of scientific level in sports related fields
- Scientific promotion of the related graduations in many aspects
- Research in the sciences related to sports physiotherapy
- Promotion of service delivery in relevant centers



Faculty of Rehabilitation

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

Tel: +98 21 77530670

Tehran – IRAN Po.Box

Fax:

Course Description

- Promotion of amateurs, athletic and national health level

7. Role definition

The relevant graduates may have a role in education, research and services.

8. Task analysis

a. Education

- To educate all people to perform correctly physical exercises
- Educate to specific groups, including athletes
- Inform society about sports injury risk factors
- Education in sports club, schools, universities and the other sports situations

b. Research

- Study and research in relevant fields

c. Services

- Service delivery accompanying with a medical team in sports situations and competitions when an injury occurred, in physical conditioning centers, rehabilitation centers, physical education centers of schools, universities and ministries for all ages, in health clinics and special physiotherapy centers.
- Physiotherapy for sports injuries to return to sport activities as soon as possible.
- Exercise therapy for the referred patients from the special physician.
- Exercise planning for special patients, such as muscular, hemophiliac, diabetic and the other patients.
- Supervision in the correct performance of exercise by all people or athletes.
- Educational programs to perform correctly the activity of daily living or exercise activities in schools or the other places.

9. Educational strategies

A combination of student based and master based programs (in addition, to attend new educational strategies such as evidence based medical education)

10. Special qualifications and application conditions



Faculty of Rehabilitation

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

Tel: +98 21 77530670

Tehran – IRAN Po.Box

Fax:

Course Description

Successfully passing the entrance examination which will be held by the ministry of health, treatment & medical education

Holding a bachelor degree in physical therapy accepted by the ministry of health, treatment & medical education

| Course | Multiply |
|---|----------|
| English language | 2 |
| Biomechanics and kinesiology | 1.5 |
| Measurement and evaluation (muscle testing) | 1.5 |
| Cardiovascular and pulmonary physiology | 1.5 |
| Muscle physiology | 1.5 |
| Exercise physiology | 1.5 |
| Anatomy | 0.5 |
| Total | 10 |

11. Similar fields in our country

Sports medicine

12. History in other countries

In many countries, including England (Manchester, King, s Archway, Sheffield Hallam, Cardiff, Kent college Universities), Australia (Curtin and Sydney Universities) and Hong Kong (Hong Kong University) this program are held.

13. Requirements to hold

According to the conditions and regulations of the development and appraisal of Ministry of Health, Treatment & Medical Education.

14. Duration of the curriculum

According to the educational regulation of the Master's degree approved by the supreme council of planning.



Faculty of Rehabilitation

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

Tel: +98 21 77530670

Tehran – IRAN Po.Box

Fax:

Course Description

Total credits:

| Credit name | Number of credits |
|-----------------------------|-------------------|
| Compulsory courses (Core) | 23 |
| Optional courses (Non core) | 5 |
| Thesis | 4 |
| Total | 32 |

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



Faculty of Rehabilitation

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

Tel: +98 21 77530670

Tehran – IRAN Po.Box

Fax:

Course Description

Table A. Compensatory Courses

| Code | Course Title | Credit(s) | | | Hour(s) | | | Prerequisite |
|--------------|--|-----------|-------|-------|---------|-------|-------|--------------|
| | | The. | Prac. | Total | The. | Prac. | Total | |
| 01 | Medical Information Technology | 0.5 | 0.5 | 1 | 9 | 17 | 26 | - |
| 02 | Advanced Bio Statistics and research Methodology | 2.5 | 0.5 | 3 | 43 | 17 | 60 | - |
| Total | | 3 | | | | | | |

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



Faculty of Rehabilitation

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

Tel: +98 21 77530670

Tehran – IRAN Po.Box

Fax:

Course Description

Table B. Compulsory Courses (Core)

| Code | Course Title | Prerequisite | Credit(s) | | | Hour(s) | | |
|--------------|---|--------------|-----------|-------|-------|---------|----------------------------|-------|
| | | | The. | Prac. | Total | The. | Prac. | Total |
| 03 | Electromyography | - | 0.5 | 0.5 | 1 | 9 | 17 | 26 |
| 04 | Exercise physiology | - | 1 | 1 | 2 | 17 | 34 | 51 |
| 05 | Sports Biomechanics (1) | - | 1 | 1 | 2 | 17 | 34 | 51 |
| 06 | Sports Biomechanics (2) | 05 | 1 | 1 | 2 | 17 | 34 | 51 |
| 07 | Sports Nutrition | - | 2 | - | 2 | 34 | - | 34 |
| 08 | Sports Injuries (1) | - | 1 | 1 | 2 | 17 | 51 (clinical training) | 68 |
| 09 | Sports Injuries (2) | 08 | 1 | 1 | 2 | 17 | 51 (clinical training) | 68 |
| 10 | Physiologic Basis of Therapeutic Exercise | - | 2 | - | 2 | 34 | - | 34 |
| 11 | Physiotherapy for sports Injuries (1) | 09, 10 | 1.5 | 0.5 | 2 | 26 | 26 (clinical training) | 52 |
| 12 | Physiotherapy for sports Injuries (2) | 11 | 1.5 | 0.5 | 2 | 26 | 26 (clinical training) | 52 |
| 13 | Clinical Practice for sports injuries | 12 | - | 3 | 3 | - | 204 (clinical training) | 204 |
| 14 | Seminar | - | 1 | - | 1 | 17 | - | 17 |
| 15 | Thesis | - | - | - | 4 | - | - | - |
| Total | | | 27 | | | | | |



Faculty of Rehabilitation

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

Tel: +98 21 77530670

Tehran – IRAN Po.Box

Fax:

Course Description

Table C. Optional Courses (Non core)

| Code | Course Title | Prerequisite | Credit(s) | | | Hour(s) | | |
|--------------|---|--------------|-----------|------|-------|---------|---------------------------|-------|
| | | | Theo. | Prac | Total | Theo. | Prac. | Total |
| 16 | Advanced EMG | 03, 11 | 1 | 1 | 2 | 17 | 51 (clinical training) | 68 |
| 17 | Cardiovascular-pulmonary Physiology | - | 3 | - | 3 | 51 | - | 51 |
| 18 | Advanced muscle and nerve neurophysiology | - | 2 | 1 | 3 | 34 | 34 | 68 |
| 19 | Advanced Analysis of Sports Activities | - | 2 | - | 2 | 34 | - | 34 |
| Total | | | 10 | | | | | |

Each M.Sc. The student has to choose five credits of above courses, suitable for his/her thesis, by the agreement of her/his supervisor and the endorsement of the university council.



Faculty of Rehabilitation

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

Tel: +98 21 77530670

Tehran – IRAN Po.Box

Fax:

Course Description

Course Title: Advanced Bio Statistics and research Methodology

Course Code: 02

Prerequisite Title (s): None

| | Theo. | Prac. | Total |
|-------------|-------|-------|-------|
| Credit (s): | 2.5 | 0.5 | 3 |
| Hour (s): | 43 | 17 | 60 |

Purpose:

The students must be able to use various library services and how to search within databases in their relevant fields. Also, they must be familiar with the important search engines to work with them and be familiar with the important relevant sites. At last, the students must be able to use email for sending and receiving files. Also, they have to learn the basis of statistics and infer the variables within a study and plot the graph of the variation, assess the normality of the data, how to change the variables to have a normal data, perform statistics to test the hypotheses, how to choose the statistical tests, interpret the results and report them.

Descriptions and outlines:

Research Methodology

Proposal parts, introduction to research types, selecting the title and providing the introduction, preparation of the purposes, study design, study execution, estimation of sample size, ethics,...

Advanced statistics

1. Definitions and primary concepts: variable and dispersion, central tendency, dispersion indices, distribution indices, systematic errors, acuity and precision.



Faculty of Rehabilitation

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

Tel: +98 21 77530670

Tehran – IRAN Po.Box

Fax:

Course Description

2. Plotting: Histogram, Linear, scatter, overlay
3. The change of popular variables and outliers
4. Estimation and hypothesis testing: statistical estimation and confidence interval, hypothesis testing, comparing the means and variances of two samples, ratio estimation and hypothesis testing of them, comparing the ratios in pairs and unpaired samples.
5. Regression: linear regression, estimation of regression parameters, hypothesis testing of regression parameters. Curve types, comparing two regression lines, inverse regression and its application in the calibration curve.
6. Analysis of variances: One-way ANOVA, Post-hoc analyses
7. Practical discussions with students in respect to their thesis

References:

8. Research in health systems, WHO.
9. DESIGNING AND CONDUCTING HEALTH SYSTEMS RESEARCH PROJECTS.
Caroline M. Varkevisser et al., the latest edition.
10. Malek Afzali MK, et al. Statistical methods and health indices. The latest edition
11. Rosner B. Fundamentals of Biostatistics. The latest edition
12. Belmont, CA: 2-Thomson Brook/Cole, the latest edition.
13. Daniel W. Biostatistics: A foundation for Analysis in the Health Science. New Jersey:
John Wiley & Sons, the latest edition.
14. Dowdy S, Wearden S. Statistics for Research. The latest edition
15. Miller JC, et al. Statistics for Analytical Chemistry. The latest edition
16. 100 Statistical Tests: Gopal K. Kanji. The latest edition.

Appraisal method:

50% as a descriptive test, 40% as a teamwork during the term, and 10% as problem solving



Faculty of Rehabilitation

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

Tel: +98 21 77530670

Tehran – IRAN Po.Box

Fax:

Course Description

Course Title: Sports Biomechanics (1)

Course Code: 05

Prerequisite Title (s): None

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

Purpose:

To familiar the students with the basic concepts of biomechanics

Description:

At first, introductory concepts of biomechanics. Then, presentation of the principles of movement analysis.

Outlines:

- The definition of movements
- Familiarization with the biomechanical principles of linear motion
- Familiarization with the biomechanical principles of rotary motion
- Familiarization with the neuromuscular concepts of motor control
- Familiarization with the center of mass, balance and stability concepts
- Study of quiet standing
- Familiarization with the kinesiology concepts of exercise and physical conditioning
- Familiarization with the biomechanical concepts of various movement types (including, striking, kicking, pushing, pulling, throwing,...)
- Familiarization with the biomechanical concepts of locomotion in water and solid surfaces
- Familiarization with the principles of motion analysis



Faculty of Rehabilitation

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

Tel: +98 21 77530670

Tehran – IRAN Po.Box

Fax:

Course Description

References:

1. Biomechanics, The latest edition, by: Y. C. Fung.
2. Fundamental of Biomechanics, The latest edition of: Duane Knudson.
3. Basic Biomechanics of the Musculoskeletal System, The latest edition, By: Margareta Nordin and Victor H Frankel.

Appraisal method:

- 60%, during the term as the student based method and home works
- 40%, at the final exam



Faculty of Rehabilitation

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

Tel: +98 21 77530670

Tehran – IRAN Po.Box

Fax:

Course Description

Course Title: Sports Biomechanics (2)

Course Code: 06

Prerequisite Title (s): 05

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

Purpose:

To familiar the students with the basic biomechanical concepts of various sports, particularly with the joint mechanics in sports

Description:

Study of the introductory concepts of biomechanics in sports fields and study of the involved joints.

Outlines:

- Practical biomechanics in sports
- Familiarization with the biomechanical principles in swimming
- Familiarization with the biomechanical principles in throwing sports
- Familiarization with the biomechanical principles in track and field
- Familiarization with the biomechanical principles in cycling
- The biomechanical principles of shoulder in sports
- The biomechanical principles of elbow in sports
- The biomechanical principles of wrist and hand in sports
- The biomechanical principles of the hip in sports
- The biomechanical principles of the knee in sports
- The biomechanical principles of the ankle and foot in sports



Faculty of Rehabilitation

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

Tel: +98 21 77530670

Tehran – IRAN Po.Box

Fax:

Course Description

- The biomechanical principles of the spine in sports

References:

1. Biomechanics and motor control of human movement, the latest edition, by: David A. Winter.
2. Biomechanics of sport and exercise, the latest edition, By: Peter M. McGinnis.
3. Clinical Biomechanics of the Lower Extremities, The latest edition, By: Ronald L. Valmassy.
4. The Biomechanics of sports Techniques, The latest edition, By: James G. Hay.
5. Running: Biomechanics and Exercise physiology in practice, the latest edition, by: Frans Bosh and Ronald Klomp.

Appraisal method:

- 60%, during the term as the student based method and home works
- 40%, at the final exam



Faculty of Rehabilitation

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

Tel: +98 21 77530670

Tehran – IRAN Po.Box

Fax:

Course Description

Course Title: Exercise Physiology

Course Code: 04

Prerequisite Title (s): None

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

Purposes:

Familiarization of the students with the physiology of the body systems in related to sports.

Description:

Study of the responses and adaptations of body systems, in particular cardiovascular, respiratory and muscular, to different exercises in various environments (dry and humid)

Outlines:

- The physiology of the musculoskeletal system in respect to exercises
- The physiology of the cardiovascular system in respect to exercises
- The physiology of the respiratory system in respect to exercises
- Various sources of energy
- The effects of aerobic exercises
- The effects of anaerobic exercises
- VO_2 max and calculation
- The effects of contractions
- The effects of environmental factors in exercise
- The effects of resistance and endurance exercises
- Morphology, body composition, determining subcutaneous fat



Faculty of Rehabilitation

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

Tel: +98 21 77530670

Tehran – IRAN Po.Box

Fax:

Course Description

- The effects of exercise on hormone
- Female athletes
- Exercise in elderly
- Physical conditioning in various sports
- Sports laboratories

References:

1. Physiology of sport and exercise, the latest edition, by: Jack H. Wilmore and David L. Costill.
2. Applied exercise and sport physiology, the latest edition, by: Terry J. Housh, et al.
3. Women and exercise: physiology and sports medicine, the latest edition, by: Mona M. Shangold and Gabe Mirkin.

Appraisal method:

- 60%, during the term as the student based method and home works
- 40%, at the final exam



Faculty of Rehabilitation

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

Tel: +98 21 77530670

Tehran – IRAN Po.Box

Fax:

Course Description

Course Title: Electromyography

Course Code: 03

Prerequisite Title (s): None

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

Purposes:

Familiarization of the students with the EMG bases for sports movement analysis

Description:

At first, introduction and principles of electromyography are discussed. Then, different contractions (isometric, concentric and eccentric) of upper and lower extremities, trunk and spinal muscles are discussed in theory and practice.

Outlines:

- Anatomy, physiology, pathology of nerve and muscle
- The characteristics of normal potentials
- Muscular potentials during rest and contraction
- Normal parameters of motor unit
- Pathologic potentials
- Familiarization with the method of recording of Nerve Conduction Velocity (NCV)
- Familiarization with the method of recording of needle and surface EMG
- Gait analysis with surface EMG
- Assessment of athletic muscular strength with surface EMG
- Study of the various methods of relaxation with surface EMG
- Study of the various movements in sports with surface EMG



Faculty of Rehabilitation

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

Tel: +98 21 77530670

Tehran – IRAN Po.Box

Fax:

Course Description

References:

1. Easy EMG, The latest edition, by: Weiss, Julie Silver and Jay Weiss.
2. EMG basics, the latest edition, by: Steve M. Gnatz
3. Atlas of electromyography, the latest edition, by: A. Arturo leis and Vicente C. Trapani.
4. The physics of sports, the latest edition, by: Angels Armenti.

Appraisal method:

- 60% during the term as the student based method and homework's
- 40% the final exam



Faculty of Rehabilitation

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

Tel: +98 21 77530670

Tehran – IRAN Po.Box

Fax:

Course Description

Course Title: Medical Information Technology

Course Code: 01

Prerequisite Title (s): None

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

Purposes:

In this course, the student must be familiarized with a personal computer and Windows OS. He/she must learn computer application and how to search in databases and digital libraries. Also, he/she must be familiarized with the well known search engines and relevant scientific sites. Finally, they must be able to work with electronic post, sending and receiving files.

Description:

The students are familiarized with the various parts of PCs, Windows OS, Internet, Important sites and Data Bases, to work practically with computers for study and research.

Outlines:

Familiarization with PC

- Recognition of various parts of the hardware of PC
- The function and importance of any parts of the hardware

Familiarization and priming the OS of windows:

- Familiarization with the history of the advanced OS, in particular windows
- Capabilities and characteristics of the OS of windows



Faculty of Rehabilitation

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

Tel: +98 21 77530670

Tehran – IRAN Po.Box

Fax:

Course Description

- How to use the windows help
- Familiarization with the important applicable windows programs

Familiarization with the important databases and applicable related softwares

- Definition and terminology of Information Technology
- Familiarization with the software of reference books as CD and how to use them.
- Familiarization with Data Bases such as Biological Abstract, EMBASE, Medline,... and how to search within them
- Familiarization with Full Text Electronic Journals and how to search within them

Familiarization with Internet

- Familiarization with the networks of information technology
- Familiarization with the important search engines and learning their various aspects
- Learning how to set search engines for connecting to the network
- Learning how to work and search with the search engines
- Familiarization with several important sites in regard to the educational course

References

1. Finding Information in Science, Technology and Medicine. Jill Lambert, Peter A. Lambert, the latest edition.
2. Information Technology Solutions for Healthcare. Professor Krzysztof Zieliński, et al., the latest edition.

How to appraise the students:

Cognitive field: Assessments of the students in the middle and at the end of course with tests

Psychomotor field: practical test for skill assessment of the students to work with PC, OS windows and internet search



Faculty of Rehabilitation

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

Tel: +98 21 77530670

Tehran – IRAN Po.Box

Fax:

Course Description

Course Title: Sports Nutrition

Course Code: 07

Prerequisite Title (s): None

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

Purpose:

Familiarization of the students with the nutritional concepts in athletes

Description:

Giving the importance of diet and its role activities, the balanced diet, supplementary diet, and how to keep weight in athletes and their needs are discussed.

Outlines:

- Familiarization with the athlete's needs (proteins, fats, carbohydrates, vitamins, minerals, water and electrolytes)
- Energy is consumed in athletes
- Calorie requirement of athletes in various types of sports
- Familiarization with the balanced diet in athletes: proper diet in stamina athletes
- Familiarization with the balanced diet in athletes: proper diet in power athletes
- The balance of acid and alkali during rigorous exercises
- Familiarization with how to compensate for the water and electrolytes during exercise (familiarization with protein drinks)
- Familiarization with athlete's diet before and after competition
- Familiarization with the proper methods of increase or decrease weight and keep the proper weight for competitions
- Familiarization with the allergic and intolerance of diet
- Familiarization with supplementary



Faculty of Rehabilitation

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

Tel: +98 21 77530670

Tehran – IRAN Po.Box

Fax: _____

Course Description

References:

1. Sports Nutrition: An introduction to energy production and performance, the latest edition, By: Asker E. Jeukendrup and Michael Gleeson.
2. Advanced Sports Nutrition, The latest edition, By: Dan Benardot.
3. Sport Nutrition for Endurance Athletes, the latest edition, By: Monique Ryan.

Appraisal method:

- 60% during the term as the student based method and homework's
- 40% the final exam



Faculty of Rehabilitation

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

Tel: +98 21 77530670

Tehran – IRAN Po.Box

Fax:

Course Description

Course Title: Sports injuries (1)

Course Code: 08

Prerequisite Title (s): None

| | Theo. | Prac. | Total |
|-------------|-------|-------|-------|
| Credit (s): | 1 | 1 | 2 |
| Hour (s): | 17 | 51 | 68 |

Purpose:

Familiarization with and have an experience with the structure and mechanisms of injury and repair of ligaments, tendons, muscles, bones and cartilages.

Description:

At first, study of various body structures (ligaments, tendons, muscles, bones and cartilages) and their injuries and treatments. Then, they apply these concepts as a clinical training.

Outlines:

Ligaments injuries:

- Ligaments structure and function
- Blood and nerve supply of the ligaments
- Biochemical structure of the ligaments
- Biomechanical behavior of the ligaments
- The effect of immobilization and exercise on the ligaments
- Injury mechanisms of ligaments
- Repair phases of the ligaments
- The effect of various treatments on repair (Immobilization, controlling movements, ice, heat, surgery...)



Faculty of Rehabilitation

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

Tel: +98 21 77530670

Tehran – IRAN Po.Box

Fax:

Course Description

Tendon injuries:

- Tendons structure and function
- Biomechanical behavior of the tendons
- The effect of exercise, disuse and overuse on the tendons
- Tendon injuries
- Tendon injuries due to overuse
- Tendon injuries due to various factors (including, Endocrine, eccentric force, sudden loading, compression force)
- Repair phases of the tendons
- The effect of various treatments on tendon repair (including, modalities, friction massage, therapeutic exercise, surgery)

Bone injuries:

- Microscopic and macroscopic structure of the bones
- Biomechanical behavior of the bones during loading
- Repair phases of the bone
- The effects of exercise on the bone
- Stress fractures
- The effect of immobilization on the bone
- The effects of diseases of the bones (including diabetes, osteoporosis)

The cartilage and other structure injuries:

- The structures of the cartilages (cell-matrix)
- Hyaline cartilage
- Fibrous cartilage
- Intervertebral disc
- Meniscus
- Degenerative mechanism of cartilages
- The repair process of the cartilages
- The response of the cartilage to mechanical pressures

Muscular injuries:



Faculty of Rehabilitation

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

Tel: +98 21 77530670

Tehran – IRAN Po.Box

Fax:

Course Description

- The structure and function of the muscles
- The biomechanical behavior of the muscles
- Muscle strength and the effect of resistive exercises on the muscles
- Muscular changes with aging
- Muscular injuries and the mechanisms
- Treatment of muscle injuries
- Myalgia and delays onset muscle soreness (DOMS)
- The effect of modalities on muscular injuries
- Prevention of muscle injuries

References:

1. Sports medicine: Pathology, The latest edition, By: Olof Ringertz.
2. Sport Injuries: Diagnosis and Management, The latest edition, By: Christopher Morris.
3. Essential sports medicine, the latest edition, by: Peter Brukner et al.

Appraisal method:

- 60% writing test
- 40% the clinical practice and homework



Faculty of Rehabilitation

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

Tel: +98 21 77530670

Tehran – IRAN Po.Box

Fax:

Course Description

Course Title: Sports injuries (2)

Course Code: 09

Prerequisite Title (s): None

| | Theo. | Prac. | Total |
|-------------|-------|-------|-------|
| Credit (s): | 1 | 1 | 2 |
| Hour (s): | 17 | 51 | 68 |

Purpose:

Familiarization of the students with theories and having an experience about prevalent joint injuries in sports and mechanisms of injury and repair of ligaments, tendons, muscles, bones and cartilages.

Description:

Study of the structure and mechanism of the common injuries of various body joints. Then, they apply these concepts as a clinical training.

Outlines:

- The most common sports injuries of the shoulder
- The most common sports injuries of the elbow
- The most common sports injuries of the wrist and hand
- The most common sports injuries of the hip
- The most common sports injuries of the knee
- The most common sports injuries of the ankle and foot
- The most common sports injuries of the spine



Faculty of Rehabilitation

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

Tel: +98 21 77530670

Tehran – IRAN Po.Box

Fax:

Course Description

References:

1. Rehabilitation techniques for sports medicine and Athletic training, the latest edition, By: William E. Prentice.
2. Current diagnosis and treatment in sports medicine, the latest edition, By: Patric J McMahon.
3. Sport injuries and emergencies: A quick response manual, the latest edition, By: Aaron Rubin.

Appraisal method:

- 60% writing test
- 40% the clinical practice and homework



Faculty of Rehabilitation

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

Tel: +98 21 77530670

Tehran – IRAN Po.Box

Fax:

Course Description

Course Title: Seminar

Course Code: 15

Prerequisite Title (s): None

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

Purpose:

Familiarization with the valid journals and original articles in different sports physiotherapy fields.

Description:

How to search the articles that are related to the thesis subject and how to present the progress of the thesis.

References:

How to use the well known databases (Medline, Pubmed, Ovid, EMBASE,...) and find the latest useful articles.

Appraisal method:

- Seminar presentation



Faculty of Rehabilitation

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

Tel: +98 21 77530670

Tehran – IRAN Po.Box

Fax:

Course Description

Course Title: Thesis

Course Code: 15

Prerequisite Title (s): None

| | Theo. | Prac. | Total |
|-------------|-------|-------|-------|
| Credit (s): | 0 | 4 | 4 |
| Hour (s): | 0 | 0 | 0 |

Purpose:

Application of the learned theories to issue practical and useful solutions of the health problems and promote efficiency in sports physiotherapy

Description and outlines:

Students design, perform and complete their own research in sports physiotherapy fields under the supervision of their supervisor according to the educational regulation of the supreme council of planning.

References:

According to the supervisor

Appraisal method:

According to the educational regulation of the supreme council of planning.



Faculty of Rehabilitation

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

Tel: +98 21 77530670

Tehran – IRAN Po.Box

Fax:

Course Description

Course Title: Advanced Electromyography

Course Code: 16

Prerequisite Title (s): 03, 11

| | Theo. | Prac. | Total |
|-------------|-------|-------|-------|
| Credit (s): | 1 | 1 | 2 |
| Hour (s): | 17 | 51 | 68 |

Purposes:

Familiarization of the students with the principles of EMG and how to use them for diagnosing muscle and nerve injury and diseases.

Description:

To familiarize with the principles of electromyography in theory and practice.

Outlines:

- Anatomy, physiology, pathology of nerve and muscle
- The characteristics of motor unit potentials
- Motor potentials during insertional activity and movement
- Potential during rest
- Potential during muscle contraction
- Normal parameters of a motor unit
- Comparing normal with pathologic potentials
- End plate potential
- Motor end plate
- Pathologic motor unit potential: high frequency, stimulation duration, shape, number and repetition of potentials, motor unit in anterior horn cell diseases, frequency of motor unit potentials in peripheral nerve diseases,
- Frequency of motor unit potentials in muscular diseases



Faculty of Rehabilitation

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

Tel: +98 21 77530670

Tehran – IRAN Po.Box

Fax:

Course Description

- Spontaneous activities
- Fibrillation potentials
- Positive sharp wave
- Fasciculation
- High frequency discharge
- Pathologic electromyography: manifestations of upper motor neuron diseases, anterior horn cell diseases and myopathies with surface EMG

References:

1. EMG basis, the latest edition, By: Steve M. Gnatz.
2. Atlas of electromyography, the latest edition, By: A. Arturo Leis and Vicente C. Trapani.
3. The physics of sports (Physics of sports), the latest edition, By: Angels Armenti.

Appraisal method:

- 60% during the term as the student based method and homework
- 40% the final exam



Faculty of Rehabilitation

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

Tel: +98 21 77530670

Tehran – IRAN Po.Box

Fax:

Course Description

Course Title: Physiologic Basis of Therapeutic Exercise

Course Code: 10

Prerequisite Title (s): None

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

Purpose:

To familiar the students with the physiologic basis of various sports physiotherapy techniques

Description

The common exercises used by physiotherapists, various techniques and their physiology are discussed.

Outlines:

- Familiarization with the physiologic principles of conditioning and fitness
- Familiarization with the principles of resistive, endurance and isokinetic exercises
- Familiarization with the physiologic principles of flexibility exercises
- Familiarization with the physiologic principles of plyometric training
- Familiarization with the physiologic principles of proprioceptive and neuromuscular control training



Faculty of Rehabilitation

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

Tel: +98 21 77530670

Tehran – IRAN Po.Box

Fax:

Course Description

- Familiarization with the physiologic principles of open and closed kinematic chains
- Familiarization with the physiologic principles of functional physiotherapy in sports

References:

1. Instant notes in sport and exercise physiology, the latest edition, By: K. Brich.
2. Rehabilitation techniques for sports medicine and athletic training, the latest edition, By: William E. Prentice.
3. Rehabilitation of sport injuries: Scientific basis (Encyclopedia of sports medicine), the latest edition, By: Walter R. Frontera.
4. Physiology of sport and exercise, the latest edition, By: Jack H. Wilmore and David L. Costill.
5. Physiology of sport, the latest edition, By: Thomas Riley.

Appraisal method:

- 40% during the term as the student based method and homework
- 60% the final exam



Faculty of Rehabilitation

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

Tel: +98 21 77530670

Tehran – IRAN Po.Box

Fax:

Course Description

Course Title: Physiotherapy for sports Injuries (1)

Course Code: 11

Prerequisite Title (s): 09, 10

| | Theo. | Prac. | Total |
|-------------|-------|-------|-------|
| Credit (s): | 1.5 | 0.5 | 2 |
| Hour (s): | 26 | 26 | 52 |

Purpose:

To familiar the students with the principles of various sports physiotherapy techniques

Description

The common techniques used by physiotherapists that are highly applied in sports fields are discussed. Then, they apply these concepts as a clinical training.

Outlines:

- The purposes of physiotherapy for sports injuries , including prevention, assessment, treatment and rehabilitation
- Primary physiotherapy in sports injuries
- Familiarization with the principles of taping techniques
- Familiarization with the principles of application of protective devices in sports
- Familiarization with the principles of mobilization techniques in sports physiotherapy
- Familiarization with the principles of pharmacology
- Application of physiotherapeutic modalities in sports
- Application of aquatic therapy in sports physiotherapy



Faculty of Rehabilitation

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

Tel: +98 21 77530670

Tehran – IRAN Po.Box

Fax:

Course Description

- Familiarization with the principles of drug abuse

References:

1. Sport injury assessment and rehabilitation, the latest edition, By: David Reid.
2. Rehabilitation techniques for sports medicine and athletic training, the latest edition, By: William E. Prentice.
3. Sport Injuries: Diagnosis and Management, The latest edition, By: Christopher Morris.

Appraisal method:

- 40% writing test at the final
- 60% the clinical practice and homework



Faculty of Rehabilitation

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

Tel: +98 21 77530670

Tehran – IRAN Po.Box

Fax:

Course Description

Course Title: Physiotherapy for sports Injuries (2)

Course Code: 12

Prerequisite Title (s): 11

| | Theo. | Prac. | Total |
|-------------|-------|-------|-------|
| Credit (s): | 1.5 | 0.5 | 2 |
| Hour (s): | 26 | 26 | 52 |

Purpose:

To familiar the students with the principles of physiotherapy and rehabilitation for various joint injuries in sports

Description

The common techniques used by physiotherapists that are highly applied in sports injuries and joint injuries are discussed. Then, they apply these concepts as a clinical training.

Outlines:

- The physiotherapy of the common shoulder injuries in sports
- The physiotherapy of the most common elbow injuries in sports
- The physiotherapy of the common wrist and hand injuries in sports
- The physiotherapy of the most common hip injuries in sports
- The physiotherapy of the most common knee injuries in sports
- The physiotherapy of the common leg injuries in sports
- The physiotherapy of the common ankle and foot injuries in sports



Faculty of Rehabilitation

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

Tel: +98 21 77530670

Tehran – IRAN Po.Box

Fax:

Course Description

- The physiotherapy of the common spine injuries in sports

References:

1. Sports injury prevention and rehabilitation, the latest edition, By: Eric Shamus and Jennifer Shamus.
2. The complete Guide to sports Injuries: How to treat fractures, Bruises, Sprains, Strains, Dislocations, Head Injury, the latest edition, by: H. Winter Griffith and Mark Pederson.
3. Rehabilitation of sports injuries: Current concepts, the latest edition, By: G. Puddu, et al.
4. Rehabilitation in sports medicine, the latest edition, By: Paul K. Canavan.
5. Textbook of sports medicine, the latest edition, By: Michael K. Jaer.
6. Techniques in musculoskeletal rehabilitation, the latest edition, By: William E. Prentice and Michael L. Voight.
7. ABC of sports medicine, the latest edition, By: Mark Harries, et al.

Appraisal method:

- 40% writing test at the final
- 60% the clinical practice and homework



Faculty of Rehabilitation

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

Tel: +98 21 77530670

Tehran – IRAN Po.Box

Fax:

Course Description

Course Title: Clinical Practice for sports injuries

Course Code:

Prerequisite Title (s): 12

| | Theo. | Prac. | Total |
|-------------|-------|-------|-------|
| Credit (s): | 0 | 3 | 3 |
| Hour (s): | 0 | 204 | 204 |

Purpose:

The students will acquire the skills of the physiotherapeutic principles of sports injuries in sports clinics of physiotherapy

Description:

The students will acquire the necessary skills of the techniques as follows:

Treatment of acute injuries of athletes in the competition time. Treatment for chronic conditions. Various treatment techniques are used for these conditions and for specific injuries, for example, tennis elbow, golf elbow, meniscus collateral injuries in soccer, wrist injuries in volleyball.

Outlines:

- Hip and pelvic injuries
- Thigh injuries
- Knee injuries



Faculty of Rehabilitation

Tehran University of Medical Sciences & Health Services

Enghelab Street, Pich-e-Shemiran

Tel: +98 21 77530670

Tehran – IRAN Po.Box

Fax:

Course Description

- Leg injuries
- Ankle and foot injuries
- Elbow injuries
- Wrist and hand injuries
- Spinal injuries

References:

According to master views

Appraisal method:

- 50% on the final exam of clinical practice
- 50% during the clinical practice and homework



Faculty of Rehabilitation

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

Tel: +98 21 77530670

Tehran – IRAN Po.Box

Fax:

Course Description

Course Title: Cardiovasculo-pulmonary Physiology

Course Code: 17

Prerequisite Title (s): None

| | Theo. | Prac. | Total |
|-------------|-------|-------|-------|
| Credit (s): | 3 | 0 | 3 |
| Hour (s): | 51 | 0 | 51 |

Purpose:

Familiarization of the students with the effects of different exercises on the physiology of the cardiovascular and pulmonary systems.

Description:

The students are familiarized with the physiology of the cardiovascular and pulmonary systems during various exercises.

Outlines:

- Study of the heart rate during simple exercises
- Comparing the static and dynamic work on heart rate and blood pressure
- Heart work during moderate, heavy and severe activities
- Study of cardiovascular work during rest and activity
- Description of aerobic exercises
- The effects of aerobic
- Comparing aerobic and anaerobic exercises
- VO₂max



Faculty of Rehabilitation

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

Tel: +98 21 77530670

Tehran – IRAN Po.Box

Fax:

Course Description

References:

1. Physiology of sport and exercise, the latest edition, By: Jack H. Wilmore and David L. Costill.
2. Applied exercise and sport physiology, the latest edition, By: Terry J. Housh, Dona J. Housh and Herbert A. Devries.

Appraisal method:

- 40% during the term as the student based method and homework
- 60% the final exam



Faculty of Rehabilitation

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

Tel: +98 21 77530670

Tehran – IRAN Po.Box

Fax:

Course Description

Course Title: Advanced muscle and nerve neurophysiology

Course Code: 18

Prerequisite Title (s): None

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

Purpose:

The students are familiarized specifically with the muscle and nerve neurophysiology.

Description:

The students learn the central nervous system structure, the mechanisms of command, and how this system act on the peripheral nervous system.

Outlines:

- Spinal reflexes accompanying with the introductory on motor control principles
- Reflex arch
- The innervation of muscle spindle, intrafusal and gamma motor neuron
- The innervation within lengthened muscle
- Stretch reflexes
- Cortical motor system
- The output of pyramidal system from cortex



Faculty of Rehabilitation

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

Tel: +98 21 77530670

Tehran – IRAN Po.Box

Fax:

Course Description

- Extra pyramidal diseases
- The activity of neurons during movements, the mechanism of action of corticospinal on motor neuron
- Basal ganglia, movement action of them, and their diseases
- How stimulations reach to the cerebellum
- Responses of the cerebellar cortex cells
- Cerebellum and movement
- Internal relationships between cerebrum and cerebellum

References:

1. Muscles, Nerves and Movement, the latest edition, By: Barbara Tyldesley and June Grieve.
2. Nerve and Muscle Excitation, the latest edition, By: Douglas Junge.
3. Nerve-Muscle Interaction, the latest edition, By: Gerta Vrbova, T. Gordon and Rosie Jones.

Appraisal method:

- 40% during the term as the student based method and homework
- 60% the final exam



Faculty of Rehabilitation

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

Tel: +98 21 77530670

Tehran – IRAN Po.Box

Fax:

Course Description

Course Title: Advanced Analysis of Sports Activities

Course Code: 19

Prerequisite Title (s): None

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

Purpose:

Assessment and analysis of neuro-musculo-skeletal systems in specific sports

Description:

The students study various sports and their Neuro-musculo-skeletal injuries, according to what they have learnt previously.

Outlines:

- Advanced study of the neuro-musculo-skeletal systems involved in power sports
- Advanced study of the neuro-musculo-skeletal systems involved in stamina sports
- Advanced study of the neuro-musculo-skeletal systems involved in aerobic sports
- Advanced study of the neuro-musculo-skeletal systems involved in anaerobic sports

References:

1. Athletic development: the art & science of functional sports conditioning. The latest edition, By: Vern Gambetta.

Appraisal method:

- 40% during the term as the student based method and homework
- 60% the final exam