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## CERTIFICATE PROGRAM ANNOUNCEMENT

### “Specialist in Isokinetic Dynamometry and Exercise”

**Duration: 3 MONTHS**

A program entitled “Specialist in Isokinetic Dynamometry and Exercise” is going to be delivered along the Long Life Learning Infrastructure of the Aristotle University of Thessaloniki.

The purpose of the program is to provide specialization in the use of isokinetic dynamometers for the assessment and improvement of muscle function. Particularly, at the end of the program the participants are expected to:

- To understand the basic characteristics of human muscle force generation.
- To understand the basic principles of isokinetic dynamometry.
- To understand the basic errors and limitations of isokinetics.
- To design a basic protocol of isokinetic assessment of muscle strength
- To interpret the results of an isokinetic muscle strength assessment.
- To design a protocol for isokinetic muscle strengthening and endurance.
- To introduce isokinetic exercise in injury prevention or rehabilitation programs

#### **Why is this program essential?**

Isokinetic dynamometers are an integral part of modern centers of sport performance assessment, orthopaedic centers and clinics, sport medicine centers, physiotherapy clinics and rehabilitation and physical conditioning centers. This is because isokinetic dynamometers allow the assessment of muscle strength with high precision, reliability and validity. Furthermore, isokinetic dynamometers allow for the exercise of specific muscles or muscle groups by modifying and monitoring the progress of muscle function.

Despite the widespread use, there are not many specialists in the use of isokinetic dynamometry and exercise. Isokinetic dynamometers are mainly operated almost through experience and practice by graduates of various faculties such as physiotherapists, sport scientists or medical doctors. The absence of a certified education program which specializes in isokinetic dynamometry would provide a significant advantage to those who hold this certificate.

#### **Who can apply?**

The program is directed to graduates of Physical Education and Sport Sciences, graduates of Medical School with specialization of orthopaedics, physical medicine and rehabilitation, neurology, rheumatology, or related research work, graduates of physiotherapy as well as University Graduates with a proven working experience in working in orthopaedic centers and clinics, sport medicine centers, physiotherapy clinics and rehabilitation and physical conditioning centers.

The seminars delivery timetable can be flexible in order to accommodate those who work to attend.

#### **Program content**

The program has a total duration of 38 teaching hours (3 ETCS). It is divided into a section of theoretical lectures and a section of hands-on practice. Particularly, the following thematic areas are included:

### **A. Theoretical Background, distance learning (28 hours)**

The theoretical background is delivered through e-learning platform and it includes the following areas.

1. Basic principles of muscle strength generation
2. Muscle strength assessment using dynamometers
3. Errors in isokinetic dynamometry
4. Design of an isokinetic protocol of maximum muscle strength assessment
5. Design of an isokinetic protocol of maximum muscle endurance assessment
6. Design of a protocol for assessing muscle force stability
7. Interpretation of isokinetic data output
8. Injury prevention and rehabilitation and isokinetic assessment
9. Isometric evaluation of muscle strength using isokinetic dynamometers
10. Basic principles of isokinetic exercise and rehabilitation: Upper body- Shoulder (Case studies and exercise program development)
11. Basic principles of isokinetic exercise and rehabilitation: Upper body- Elbow and Wrist (Case studies and exercise program development)
12. Basic principles of isokinetic exercise and rehabilitation: Lower body – Knee (Case studies and exercise program development)
13. Basic principles of isokinetic exercise and rehabilitation: Lower body – Hip and ankle (Case studies and exercise program development)

### **B. Hands-one practice (10 hours in the Laboratory of Neuromechanics of the Department of Physical Education and Sport Science at Serres, AUTH, Serres)**

Practical application will be performed at the Laboratory of Neuromechanics of the Department of Physical Education and Sport Science at Serres within a day after the first part is concluded. Depending on the needs of the participants, the practice session can include:

- Basic functions of the isokinetic dynamometer
- Software use and experimental set-up
- Knee muscles assessment- Seated – Prone Position
- Hip muscles assessment – Flexion – Extension / Abduction - Adduction
- Ankle muscles assessment
- Shoulder muscles assessment – internal/external rotation – Abduction/ abduction
- Elbow muscles assessment – flexion - extension
- Wrist muscles assessment
- Exporting and formatting the assessment report
- Basic philosophy and characteristics of isokinetics as an exercise assessment tool (eccentric, concentric, passive)

### **Assessment**

Assessment of participants will be accomplished on-line using two tests and/or a laboratory report as follows:

1<sup>st</sup> assessment test: After the first 6 lectures

2<sup>nd</sup> assessment / or report: After the end of the theoretical and prior to the practical session

### **Teaching material**

Participants will be provided with access to all lectures which include the isokinetic testing protocols per joint and special case studies. Access will be given to bibliography and projects published by the teaching staff.

## Teaching staff

Eleftherios Kellis, Professor, Department of Physical Education and Sport Science at Serres, Aristotle University of Thesssaloniki

Ioannis Amiridis, Associate Professor, Department of Physical Education and Sport Science at Serres, Aristotle University of Thesssaloniki

## Certificates

Upon successful completion of the program, participants will obtain a Certificate of Learning (ECTS) from the Aristotle University Long Life Learning Unit.

## Program dates

The program is scheduled to start on April 24, 2017. The practice session will be held in September 15th, 2017 (preliminary dates). The official language of the program is English. No translation in another language will be provided

## Registration Process

Applications will be accepted exclusively via Internet from **February 21st to March 27th 2017** in order of priority.

You can apply for registration [here](#).

The application should be accompanied by the following:

1. Short Curriculum vitae
2. Undergraduate title

The program has a maximum number of 15 participants. In the case of more applications, selection will be made based on the date of application.

The program fees are **275 Euros**. The cost includes all teaching materials (in electronic format) and quick lunch during the practical session. Travel arrangements and relevant official permissions for travelling to Greece is solely a responsibility of the participant. Assistance in cheaper accommodation will also be provided. No refunds will be provided after program initiation. Participation in the practical session is compulsory.

The fees are paid to the University's Bank Account (Details will be provided after program starts).

For more information, interested applicants can visit the laboratory of Neuromechanics site <http://neural-sr.web.auth.gr/> and to contact Professor Eleftherios Kellis at [ekellis@phed-sr.auth.gr](mailto:ekellis@phed-sr.auth.gr).

The Chairman of the  
Lifelong Learning Unit  
S. Ves, Professor

The Director  
of the program  
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