



## Information about the subject

**Degree:** Bachelor of Sciences of Physical Activity and Sport

**Faculty:** Faculty of Physical Activity and Sport Sciences

**Code:** 280217 **Name:** Training Theory and Practice in PA

**Credits:** 6,00 **ECTS** **Year:** 2 **Semester:** 2

**Module:** 2) Obligatory Formation module.

**Subject Matter:** Sports Fundamentals. **Type:** Compulsory

**Field of knowledge:** Ciencias de la Salud

**Department:** -

**Type of learning:** Classroom-based learning

**Languages in which it is taught:**

**Lecturer/-s:**

282A	<u>Julio Martin Ruiz</u> ( <b>Responsible Lecturer</b> )	julio.martin@ucv.es
282B	<u>Claudio Alberto Casal Sanjurjo</u> ( <b>Responsible Lecturer</b> )	ca.casal@ucv.es
282C	<u>Florentino Huertas Olmedo</u> ( <b>Responsible Lecturer</b> )	florentino.huertas@ucv.es
282D	<u>Julio Martin Ruiz</u> ( <b>Responsible Lecturer</b> )	julio.martin@ucv.es
282X	<u>Claudio Alberto Casal Sanjurjo</u> ( <b>Responsible Lecturer</b> )	ca.casal@ucv.es



## Module organization

### 2) Obligatory Formation module.

Subject Matter	ECTS	Subject	ECTS	Year/semester
Manifestations of human motor skills.	18,00	Body Language	6,00	1/1
		Perceptual Motor Skills	6,00	1/2
		Physical Activity in Nature	6,00	2/2
Sports Fundamentals.	42,00	Adapted Sport and Inclusive Physical Activity	6,00	2/2
		Adversary Sports	6,00	2/1
		Individual Sports	6,00	2/1
		Motor Learning and Development	6,00	1/1
		Native Sports and Games	6,00	1/2
		Team Sports	6,00	2/2
		Training Theory and Practice in PA	6,00	2/2



## Learning outcomes

At the end of the course, the student must be able to prove that he/she has acquired the following learning outcomes:

- R1 Design programs and tasks for the development of different basic physical capacities (strength, endurance, speed and range of movement), complementary (Coordination, Balance, Agility and Proprioception) and technical-tactical-strategy in different training contexts.
- R2 Analyze and critically discriminate various sources of documentary information (in Spanish and English) on methods and / or theories related to physical-sports training.
- R3 Correctly select different instruments and technologies to manage the process of physical-sports preparation and / or training in different contexts.
- R4 Argue and justify in an organized and understandable way (written or oral) methods, techniques, exercises and physical activity programs depending on the type of population and context of application.



## Competencies

Depending on the learning outcomes, the competencies to which the subject contributes are (please score from 1 to 4, being 4 the highest score):

GENERAL	Weighting			
	1	2	3	4
CG6 Develop interpersonal relationship skills and teamwork, both in international and national contexts and in interdisciplinary as well as non-interdisciplinary teams.	x			
CG7 Be able to carry out critical reasoning using the knowledge acquired.		x		
CG13 Be able to apply theoretical knowledge in practice.			x	
CG14 Use the internet properly as a means of communication and as a source of information.	x			
SPECIFIC	Weighting			
	1	2	3	4
CE 1.2 Design and apply the methodological process integrated by observation, reflection, analysis, diagnosis, execution, evaluation technical-scientific and / or dissemination in different contexts and in all sectors of professional intervention of physical activity and sport.			x	
CE 1.3 Communicate and interact appropriately and efficiently, in physical and sporting activity, in diverse intervention contexts, demonstrating teaching skills in a conscious, natural and continuous way.		x		



CE 2.1 Adapt the educational intervention to the individual characteristics and needs for the entire population and with emphasis on special populations such as: schoolchildren, the elderly (elderly), people with reduced mobility and Know how to guide, design, apply and technically-scientifically evaluate physical exercise and physical condition at an advanced level, based on scientific evidence, in different areas, contexts and types of activities for the entire population and with an emphasis on populations of a special nature such as: the elderly (elderly), schoolchildren, people with disabilities and people with pathologies, health problems or assimilated (diagnosed and / or prescribed by a doctor), taking into account gender and diversity. diversity.

X

CE 2.3 Design and apply fluently, naturally, consciously and continuously physical exercise and adequate physical condition, efficient, systematic, varied, based on scientific evidence, for the development of adaptation and improvement processes or readaptation of certain capacities of each person in relation to human movement and its optimization; with the purpose of be able to solve unstructured, increasingly complex and unpredictable problems and with an emphasis on populations of character special.

X

CE 2.5 Know how to re-adapt, retrain and / or re-educate people, groups or teams with injuries and pathologies (diagnosed and / or prescribed by a doctor), whether they compete or not, through physical-sports activities and physical exercises appropriate to their characteristics and needs.

X

CE 3.1 Analyze, identify, diagnose, promote, guide and evaluate strategies, actions and activities that promote the adherence to an active lifestyle and the participation and regular and healthy practice of physical activity and sport and physical exercise in an adequate, efficient and safe way by citizens in order to improve their integral health, well-being and quality of life, and with emphasis on populations of a special nature such as: the elderly (elderly), schoolchildren, people with disability and people with pathologies, health problems or similar (diagnosed and / or prescribed by a doctor) attending gender and diversity.

X

CE 6.1 Know and understand the bases of the methodology of scientific work.

X



X

CE 7.3 Understand, know how to explain and disseminate the functions, responsibilities and importance of a good professional Graduated in Sciences of Physical Activity and Sports as well as analyze, understand, identify and reflect critically and autonomously on their identity, training and professional performance to achieve the goals and benefits of physical activity and sport in an adequate, safe, healthy and efficient way in all the physical-sports services offered and provided and in any sector professional of physical activity and sports.

## Assessment system for the acquisition of competencies and grading system

Assessed learning outcomes	Granted percentage	Assessment method
R1, R2, R3, R4	40,00%	Carrying out a project.
R1, R2, R3, R4	40,00%	Written / oral and / or practical tests.
R1, R2, R3, R4	20,00%	Active participation.

### Observations

- The student will be able to keep the evaluation instruments passed during the 3 years following the first enrollment.
- It is necessary to obtain 50% in all the instruments to pass the subject. If this criterion is not met, the student will be graded with a maximum of 4.5 in said call.
- Attendance to the practical sessions indicated in the schedule is mandatory. In case of not attending 70%, the student will not be evaluated during that academic year in accordance with article 8 of the UCV exam regulations (it will appear as a Not Presented).



## Learning activities

The following methodologies will be used so that the students can achieve the learning outcomes of the subject:

- M2 Group dynamics and activities.
- M3 Practical lesson.
- M4 Presentation of content by the teacher.
- M5 Laboratory practices.
- M7 Small group discussion.
- M8 Resolution of problems and cases.
- M9 Attendance at practices.



Year 2023/2024

280217 - Training Theory and Practice in PA

### IN-CLASS LEARNING ACTIVITIES

	LEARNING OUTCOMES	HOURS	ECTS
THEORETICAL CLASS: Presentation of contents by the teacher. Competency analysis. Demonstration of capabilities, skills and knowledge in the classroom. M4	R1, R2, R3, R4	27,50	1,10
PRACTICAL CLASS / SEMINAR: Group dynamics and activities. Resolution of problems and cases. Practical laboratories. Data search, computer room, library, etc. Meaningful construction of knowledge through interaction and student activity. M2, M3, M8, M9	R1, R2, R3, R4	26,50	1,06
TUTORING: Supervision of learning, evolution. Small group discussion. Resolution of problems and cases. Presentation of results before the teacher. Presentation of diagrams and indexes of the proposed works. M4, M8	R1, R2, R3, R4	2,00	0,08
EVALUATION: Set of oral and / or written tests used in the evaluation of the student, including the oral presentation of the final degree project. M2, M8	R1, R2, R3, R4	4,00	0,16
<b>TOTAL</b>		<b>60,00</b>	<b>2,40</b>



## LEARNING ACTIVITIES OF AUTONOMOUS WORK

	LEARNING OUTCOMES	HOURS	ECTS
GROUP WORK: Problem solving. Preparation of exercises, memoirs, to expose or deliver in classes and / or in tutoring. M2, M7	R1, R2, R3, R4	10,00	0,40
SELF-EMPLOYED WORK: Study, individual preparation of exercises, works, memories, to expose or deliver in classes and / or in tutoring. Platform activities or other virtual spaces. M8	R1, R2, R3, R4	80,00	3,20
<b>TOTAL</b>		<b>90,00</b>	<b>3,60</b>

## Description of the contents

Description of the necessary contents to acquire the learning outcomes.

### Theoretical contents:

Content block	Contents
1 General conceptualization in the field of physical-sports training.	1 General conceptualization in the field of physical-sports training.
2 Factors involved in physical-sports training.	2 Factors involved in physical-sports training.
3 Basic principles of physical-sports training.	3 Basic principles of physical-sports training.
4 Basic physical skills training: Strength, endurance, speed and range of motion.	4 Basic physical skills training: Strength, endurance, speed and range of motion.
5 Training of complementary capacities.	5 Training of complementary capacities.



Temporary organization of learning:

Block of content	Number of sessions	Hours
1 General conceptualization in the field of physical-sports training.	1,00	2,00
2 Factors involved in physical-sports training.	3,00	6,00
3 Basic principles of physical-sports training.	3,00	6,00
4 Basic physical skills training: Strength, endurance, speed and range of motion.	21,00	42,00
5 Training of complementary capacities.	2,00	4,00



## References

### BASIC BIBLIOGRAPHY:

ACSM. (2014). *Manual ACSM para la valoración y prescripción del ejercicio*. Barcelona: Paidotribo.

Adams, G., Hather, B., Baldwin, K., & Dudley, G. (1993). *Skeletal muscle myosin heavy chain composition and resistance training*. Journal of applied physiology (Bethesda, Md.: 1985), 74(2), 911-915.

Alter, J. (2004). *Los estiramientos*. Barcelona: Paidotribo.

Alter, M. (2008). *Manual de estiramientos deportivos* (7<sup>a</sup> ed.). Madrid: Tutor.

Álvarez del Villar, C. (1985). *La preparación física del fútbol basada en el atletismo*. Madrid: Gymnos.

Alway, S., Gonyea, W., & Davis, M. (1990). *Muscle fiber formation and fiber hypertrophy during the onset of stretch-overload*. The American Journal of Physiology, 259(1 Pt 1), C92-102.

Amako, M., Oda, T., Masuoka, K., Yokoi, H., & Campisi, P. (2003). *Effect of static stretching on prevention of injuries for military recruits*. Military medicine, 168(6), 442.

Andersen, J., Klitgaard, H., & Saltin, B. (1994). *Myosin heavy chain isoforms in single fibres from m. vastus lateralis of sprinters: influence of training*. Acta Physiologica Scandinavica, 151(2), 135-142.

Anderson, B. (1984). *Estirándose*. Barcelona: Integral.

Anderson, B., & López-Lleras, L. (1991). *Ejercicios de estiramiento: flexibilidad y elasticidad*. México, DF.: Trillas.

Anderson, O. *Proprioceptive training programmes can improve muscle strength, coordination, balance, reaction times and help avoid injuries*. En [www.sportsinjurybulletin.com](http://www.sportsinjurybulletin.com).

Antón, J. (1998). *Balonmano: táctica grupal ofensiva: concepto, estructura y metodología*. Madrid: Gymnos.

Añó, V (1997). *Planificación y organización del entrenamiento juvenil*. Madrid: Gymnos.



Bacurau, R. F., Monteiro, G. A., Ugrinowitsch, C., Tricoli, V., Cabral, L. F., & Aoki, M. S. (2009). *Acute effect of a ballistic and a static stretching exercise bout on flexibility and maximal strength*. Journal of strength and conditioning research, 23(1), 304-308.  
doi:10.1519/JSC.0b013e3181874d55 [doi]

Balsom, P., Díaz, J., Ramallo, R., Riveiro, J., Patiño, D., & Rodríguez, A. (1993). *Test de campo para evaluar la capacidad de aceleraciones repetidas de los jugadores de fútbol*. Red: revista de entrenamiento deportivo, 7(2), 35-39.

Barbany, J. (1990). *Fundamentos de fisiología del ejercicio y del entrenamiento*. Barcelona: Barcanova.

Bartels, T., Proeger, S., Meyer, D., Rabe, J., Brehme, K., Pyschik, M., . . . Schwesig, R. (2016). *Fast Response Training in Youth Soccer Players*. [Hochreaktives Training bei jugendlichen Fussballspielern] Sportverletzung Sportschaden : Organ der Gesellschaft für Orthopädisch-Traumatologische Sportmedizin, 30(3), 143-148. doi:10.1055/s-0042-110250 [doi]

Baydal-Bertomeu, J., Barberá, R., Soler-Gracia, C., Peidró De Moya, M., Prat, J., & Barona De Guzmán, R. (2004). *Determinación de los patrones de comportamiento postural en población sana española*. Acta Otorrinolaringológica Española, 55(6), 260-269.

Beckett, J., Schneiker, K., Wallman, K., Dawson, B., & Guelfi, K. (2009). *Effects of static stretching on repeated sprint and change of direction performance*. Medicine Science in Sports Exercise, 41(2), 444.

Behm, D., & Chaouachi, A. (2011). *A review of the acute effects of static and dynamic stretching on performance*. European journal of applied physiology, 111(11), 2633-2651.

Behm, D., & Sale, D. (1993). *Velocity specificity of resistance training*. Sports Medicine, 15(6), 374-388.

Berthoin, S., Blondel, N., Billat, V., & Gerbeaux, M. (2001). *La vitesse à V*. STAPS, 54, 045-061.

Billat, V. (2002). *Fisiología y metodología del entrenamiento*. Barcelona: Paidotribo.

Blackburn, J., Riemann, B., Myers, J., & Lephart, S. (2003). *Kinematic analysis of the hip and trunk during bilateral stance on firm, foam, and multiaxial support surfaces*. Clinical biomechanics (Bristol, Avon), 18(7), 655-661. doi:S0268003303000913 [pii]

Blázquez, D. (1995). *La iniciación deportiva y el deporte escolar*. Barcelona: INDE.



Bompa, T. (1983). *Theory and Methodology of training: The key of athletes performance.* Dubuque, Iowa: Hunt Publishing Company.

Bompa, T. (2006). *Periodización del entrenamiento deportivo.* Barcelona: Paidotribo.

Bompa, T. (2016). *Periodización. Teoría y Metodología del entrenamiento.* Barcelona: Hispano Europea.

Bompa, T. O. (2000). *Periodización del Entrenamiento Deportivo: Programa para obtener el máximo rendimiento en 35 deportes.* Barcelona: Paidotribo.

Bompa, T.O. (2003). *Periodización. Teoría y Metodología del Entrenamiento.* Barcelona: Paidotribo.

Borg, G. A. (1982). *Psychophysical bases of perceived exertion.* Medicine and Science in Sports and Exercise, 14(5), 377-381.

Bosco, C. (1994). *La valoración de la fuerza con el test de Bosco.* Barcelona: Paidotribo.

Bosco, C. (2000). *La fuerza muscular.* Barcelona: Inde.

Bosquet, L., Léger, L., & Legros, P. (2002). *Methods to determine aerobic endurance.* Sports Medicine, 32(11), 675-700.

Bragada, J. A., Santos, P., Maia, J. A., Colaço, P., Lopes, V. P., & Barbosa, T. M. (2010). *Longitudinal study in 3,000 m male runners: relationship between performance and selected physiological parameters.* Journal of sports science & medicine, , 439-444.

Bravo, J., Pascua, M., García-Verdugo, M., Landa, L., Gil, F., & Marín, J. (1998). *Carreras y marcha: Atletismo 1.* Madrid: Real Federación Española de Atletismo.

Bravo, J., Pascua, M., Gil, F., & Ballesteros, J. (1991). *Atletismo (I): Carreras (1<sup>a</sup> ed.).* Madrid: Real Federación Española de Atletismo.

Brown L. (2008). *Entrenamiento de la fuerza:* Madrid: Panamericana.

Brown, L.E. (2007). *Entrenamiento de la velocidad, agilidad y rapidez.* Barcelona: Paidotribo.

Brzycki, M. (1993). *Strength testing—predicting a one-rep max from reps-to-fatigue.* Journal of Physical Education, Recreation & Dance, 64(1), 88-90.



Buroker, K. C., & Schwane, J. A. (1989). *Does Postexercise Static Stretching Alleviate Delayed Muscle Soreness?*. Physician and Sportsmedicine, 17(6)

Campos, J. , & Ramón, V. (2001). *Teoría y planificación del entrenamiento deportivo*. Barcelona: Paidotribo.

Cannon, R. J., & Cafarelli, E. (1987). *Neuromuscular adaptations to training*. Journal of applied physiology (Bethesda, Md.: 1985), 63(6), 2396-2402.

Castañer, M. (2001). *El cuerpo: gesto y mensaje no verbal*. Tándem. Didáctica de la Educación Física, 3, 39-49.

Chicharro, J. L., Aznar, S., Fernández, A., López, L.M., Lucía, A. ,& Pérez, M. (2008). *Transición aeróbica-anaeróbica. Concepto, metodología de determinación y aplicaciones*. Madrid: Master Line & Prodigio.

Church, J. B., Wiggins, M. S., Moode, F. M., & Crist, R. (2001). *Effect of warm-up and flexibility treatments on vertical jump performance*. Journal of strength and conditioning research, 15(3), 332-336.

Colado, J.C., Chulvi, I., & Heredia J.R. (2008). *Criterios para el diseño de los programas de acondicionamiento muscular desde una perspectiva funcional*. En Rodríguez, P.L. (Ed.). *Ejercicio físico en salas de acondicionamiento muscular*. Madrid: Panamericana.

Cometti, G. (1988). *Bases científicas de la Musculación Moderna*. Revista de Entrenamiento deportivo, 1, 2-8.

Cometti, G. (1989). *Électrostimulation, données théoriques et pratiques. Les méthodes modernes de musculation*. Tome I et II () université de Bourgogne Dijon.

Cometti, G. (1998). *Los métodos modernos de musculación*. Barcelona: Paidotribo.

Cometti, G. (2003). *Les limites du stretching:" Intérêt des étirements avant et après la performance*. EPS: Revue education physique et sport, (304), 29-33.

Cometti, G. (2007). *El entrenamiento de la velocidad*. Barcelona: Paidotribo.

Cornwell, A., Nelson, A. G., & Sidaway, B. (2002). *Acute effects of stretching on the neuromechanical properties of the triceps surae muscle complex*. European journal of applied physiology, 86(5), 428-434.



Costill, D., Sharp, R., & Troup, J. (1980). *Muscle strength: contributions to sprint swimming*. Swimming World, 21, 29-34.

Cuissard, N., Duchateau, J., & Hainaut, K. (1988). *Muscle stretching and motoneuron excitability*. European journal of applied physiology and occupational physiology, 58(1-2), 47-52.

Delavier, F. (2000). *Guía de los movimientos de musculación*. Barcelona: Paidotribo

Delavier, F. (2004). *Guía de los movimientos de musculación. descripción anatómica* (4th ed.). Barcelona: Paidotribo.

Delgado, M., Gutiérrez, A., & Castillo, M.J. (1997). *Entrenamiento físico-deportivo y alimentación*. De la infancia a la edad adulta. Barcelona: Paidotribo

Demarle, A. P., Slawinski, J. J., Laffite, L. P., Bocquet, V. G., Koralsztein, J. P., & Billat, V. L. (2001). *Decrease of O<sub>2</sub> deficit is a potential factor in increased time to exhaustion after specific endurance training*. Journal of applied physiology (Bethesda, Md.: 1985), 90(3), 947-953.

Dessons, C., Drut, G., Dubois, R., Hebreard, J., Hubiche, J., Lacour, R., . . . Monnenet, J. (1986). *Tratado de atletismo, carreras: sprint, medio fondo, relevos, vallas*. Madrid: Hispano Europea.

Docherty, D., & Sporer, B. (2000). *A proposed model for examining the interference phenomenon between concurrent aerobic and strength training*. Sports Medicine, 30(6), 385-394.

Esparr, X. (2003). *La planificación del entrenamiento en Balonmano*. Real Federación Española de Balonmano,

Faria, E. W., Parker, D. L., & Faria, I. E. (2005). *The science of cycling*. Sports medicine, 35(4), 285-312.

Fenstermaker, K. L., Plowman, S. A., & Looney, M. A. (1992). *Validation of the Rockport Fitness Walking Test in females 65 years and older*. Research quarterly for exercise and sport, 63(3), 322-327.

Fidelus, K., & Kocjasz, J. (1989). *Atlas de ejercicios físicos para el entrenamiento*. Madrid: Gymnos.

Fletcher, J. R., Esau, S. P., & Macintosh, B. R. (2009). *Economy of running: beyond the measurement of oxygen uptake*. Journal of applied physiology (Bethesda, Md.: 1985), 107(6),



1918-1922. doi:10.1152/japplphysiol.00307.2009 [doi]

Forteza, K., Comellas, J., y López, P. (2004). *El entrenador personal. Fitness y salud.* Barcelona: Hispano-Europea.

Foster, C., & Lucia, A. (2007). *Running economy.* Sports medicine, 37(4-5), 316-319.

Freiwald, J. (1996). *El calentamiento en el deporte.* Barcelona: Hispano Europea.

Gámez J., Garrido, D., Montaner, C., & Alcántara E. (2008). *Aplicaciones tecnológicas para el análisis de la actividad física para el rendimiento y la salud.* In M. Izquierdo (Ed.), Biomecánica y Bases Neuromusculares de la Actividad Física y el Deporte. (1<sup>a</sup> ed., pp. 173-201). Madrid: Panamericana.

Gámez, F. (2009). *Stretching global activo (SGA).* Sport Training Magazine, (23), 60-61.

García J.M., Navarro, M., & Ruiz, J.A. (1996). *Bases teóricas del entrenamiento deportivo.* Madrid: Gymnos.

García Manso, J.M. (2002). *La Fuerza.* Madrid: Gymnos.

García, J. (1999). *Alto rendimiento: la adaptación y la excelencia deportiva.* Madrid: Gymnos.

García, J., Navarro, F., & Ruiz, J. (1993). *Bases Teóricas del Entrenamiento Deportivo.* Madrid: Gymnos.

García, J., Navarro, F., y Ruiz, J. (1996). *Bases teóricas del entrenamiento deportivo. Principios y aplicaciones.* Madrid: Gymnos.

García, J., Navarro, M., Ruiz, J., & Martín Acero, R. (1998). *La velocidad.* Madrid: Gymnos.

García, J.M., Navarro, M., & Ruiz, J.A. (1996). *Pruebas para la valoración de la capacidad motriz en el deporte.* Madrid: Gymnos.

García-Verdugo, M., & Landa, L. (2004). *Atletismo 4: Mediofondo y Fondo (La preparación del corredor de resistencia)* (1<sup>a</sup> ed.). Madrid: Real Federación Española de Atletismo.

Gautier, G., Thouvarecq, R., & Larue, J. (2008). *Influence of experience on postural control: effect of expertise in gymnastics.* Journal of motor behavior, 40(5), 400-408.

Generelo, E., & Tierz, P. (1994). *Cualidades físicas I y II (Resistencia y flexibilidad, fuerza,*



velocidad, agilidad y calentamiento). Zaragoza: Imagen y Deporte.

González, J., & Gorostiaga, E. (1995). *Fundamentos del entrenamiento de la fuerza: aplicación al alto rendimiento deportivo*. Barcelona: Inde.

González, J., y Rivas, J. (2007). *Bases de la programación del entrenamiento de la fuerza*. Barcelona: Inde.

Gorostiaga, E. M., Walter, C. B., Foster, C., & Hickson, R. C. (1991). *Uniqueness of interval and continuous training at the same maintained exercise intensity*. European journal of applied physiology and occupational physiology, 63(2), 101-107.

Gorrotxategi, A., & Algarra, J. L. (1996). *Entrenar con pulsómetro: preparación personalizada para el ciclista*. Bilbao: Dorleta.

Gribble, P., Hertel, J., & Plisky, P. (2012). *Using the Star Excursion Balance Test to assess dynamic postural-control deficits and outcomes in lower extremity injury: a literature and systematic review*. Journal of athletic training, 47(3), 339-357.

Grosser, M. (1991). *Entrenamiento al alto rendimiento deportivo*. Barcelona: Martínez Roca.

Grosser, M. (1992). *Entrenamiento de la velocidad: fundamentos, métodos y programas*. Barcelona: Martínez Roca.

Grosser, M., & Müller, H. (1989). *Desarrollo muscular: un nuevo concepto de musculación ("Power Stretch")*. Barcelona: Hispano Europea.

Grosser, M., & Starischka, S. (1988). *Test de la condición física*. Barcelona: Martínez Roca.

Grosser, M., Starischa, S., & Zimmermann, E. (1985). *Principios del entrenamiento deportivo*. Barcelona: Martínez Roca.

Grosser, M., Starischka, S., Zimmermann, E., & Luldjuraj, P. (1988). *Principios del entrenamiento deportivo*. Barcelona: Martínez Roca.

Grosser, M., Zintl, F., & Brüggemann, P. (1989). *Alto rendimiento deportivo: planificación y desarrollo*. Barcelona: Martínez Roca.

Häfeling, V. (2010). *La coordinación y el entrenamiento propioceptivo*. Barcelona: Paidotribo

Hagglund, M., Walden, M., & Ekstrand, J. (2006). *Previous injury as a risk factor for injury in elite*



*football: a prospective study over two consecutive seasons.* British journal of sports medicine, 40(9), 767-772. doi:bjsm.2006.026609 [pii]

Hahn, E. (1988). *Entrenamiento con niños. Teoría, práctica, problemas específicos.* Barcelona: Martínez Roca.

Harre, D. (1987). *Teoría del entrenamiento deportivo.* Buenos Aires: Editorial Stadium.

Hartmann, J., & Tünnemann, H. (1996). *Entrenamiento moderno de la fuerza.* Barcelona: Paidotribo.

Harvey, D. (1998). *Assessment of the flexibility of elite athletes using the modified Thomas test.* British journal of sports medicine, 32(1), 68-70.

Hauptmann, M., & Harre, D. (1987). *El entrenamiento de la fuerza máxima.* Red: revista de entrenamiento deportivo, 1(2), 11-18.

Hennig, E., & Podzielny, S. (1994). *The effect of stretching and warm-up exercises on the vertical jumping performance.* Deutsche Z.für Sportmedizin, 45, 253-260.

Herbert, R. D., & Gabriel, M. (2002). *Effects of stretching before and after exercising on muscle soreness and risk of injury: systematic review.* BMJ (Clinical research ed.), 325(7362), 468.

Herda, T. J., Cramer, J. T., Ryan, E. D., McHugh, M. P., & Stout, J. R. (2007). *Acute Effects Of Static Versus Dynamic Stretching On Isometric Strength And Neuromuscular Function Of The Leg Flexors.* Medicine & Science in Sports & Exercise, 39(5), S433.

Hickson, R. C., Hidaka, K., & Foster, C. (1994). *Skeletal muscle fiber type, resistance training, and strength-related performance.* Medicine and science in sports and exercise, 26(5), 593-598.

Howard, J. D., & Enoka, R. M. (1987). *Enhancement of maximal force by contralateral-limb stimulation.* Journal of Biomechanics, 20(9), 908.

Huesa, F., García, J., & Vargas, J. (2005). *Dinamometría isocinética.* Rehabilitación, 39(6), 288-296.

Hunter, J. P., & Marshall, R. N. (2002). *Effects of power and flexibility training on vertical jump technique.* Medicine and science in sports and exercise, 34(3), 478-486.

Ikai, M., & Fukunaga, T. (1968). *Calculation of muscle strength per unit cross-sectional area of human muscle by means of ultrasonic measurement.* Internationale Zeitschrift für Angewandte



Physiologie Einschliesslich Arbeitsphysiologie, 26(1), 26-32.

Israel, L., Israel, J., Piaget, J., Marfá, J., Isaac, G., Juana, T., . . . Jiménez, C. (1976). *El médico frente al enfermo*. Barcelona: José Blatlló.

Izquierdo, M. (2008). *Biomecánica y Bases Neuromusculares de la Actividad Física y el Deporte*. Madrid: Panamericana.

Jiménez, J., Álvarez, G., Balíus, R., & Villa, J. (2007). *Avances técnicos aplicados a la ecografía musculoesquelética de la lesión deportiva*. Apunts Medicina de l" Esport (Castellano), 42(154), 66-75.

Johansson, P., Lindström, L., Sundelin, G., & Lindström, B. (1999). *The effects of preexercise stretching on muscular soreness, tenderness and force loss following heavy eccentric exercise*. Scandinavian Journal of Medicine & Science in Sports, 9(4), 219-225.

Kabat, H. (1952). *Studies on neuromuscular dysfunction. XV. The role of central facilitation in restoration of motor function in paralysis*. Archives of physical medicine, 33(9), 521-533.

Kaemer, W.J., & Hakkinen, K. (2006). *Entrenamiento de la Fuerza*. Barcelona: Hispano Europea.

Kapandji, I. (2006). *Fisiología articular. Tomo 1. Hombro, codo, pronosupinación, muñeca, mano*. (6<sup>a</sup> ed.). Madrid: Masson.

Kitabayashi, T., Demura, S., & Noda, M. (2003). *Examination of the factor structure of center of foot pressure movement and cross-validity*. Journal of physiological anthropology and applied human science, 22(6), 265-272.

Knudson, D., Bennett, K., Corn, R., Leick, D., & Smith, C. (2001). *Acute effects of stretching are not evident in the kinematics of the vertical jump*. The Journal of Strength & Conditioning Research, 15(1), 98-101.

Knutgen, H., & Kraemer, W. (1987). *Terminology and measurement in exercise performance*. The Journal of Strength & Conditioning Research, 1(1), 1-10.

Komi, P. V., & Bosco, C. (1978). *Muscles by men and women*. Med Sci Sport, 10, 261-265.

Kraft, W., Schober, H., Schmidt, H., & Wittekopf, G. (1990). *Stretching und muskuläres Entspannungsverhalten am M. quadriceps femoris*. Zeitschrift für Physiotherapie, 42(04), 237-243.



Kubo, K., Kanehisa, H., & Fukunaga, T. (2002). *Effects of resistance and stretching training programmes on the viscoelastic properties of human tendon structures in vivo*. The Journal of physiology, 538(1), 219-226.

Lander, J. (1985). *Maximum based on reps*. NSCA journal, 6, 60-61.

Legido, J. (1986). *Fatiga y entrenamiento*. III Jornadas Nacionales de Medicina en Atletismo. Pamplona, 109-120.

Lephart, S., Riemann, B., & Fu, F. (2000). *Introduction to the sensorimotor system Human kinetics*.

LeSuer, D., McCormick, J., Mayhew, J., Wasserstein, R., & Arnold, M. (1997). *The Accuracy of Prediction Equations for Estimating 1-RM Performance in the Bench Press, Squat, and Deadlift*. The Journal of Strength & Conditioning Research, 11(4), 211-213.

Mackala, K., Fostiak, M., & Kowalski, K. (2015). *Selected determinants of acceleration in the 100m sprint*. Journal of human kinetics, 45, 135-148. doi:10.1515/hukin-2015-0014 [doi]

Magnusson, S., Aagard, P., Simonsen, E., & Bojsen-Møller, F. (1998). *A biomechanical evaluation of cyclic and static stretch in human skeletal muscle*. International Journal of Sports Medicine, 19(05), 310-316.

Malliou, P., Gioftsidou, A., Pafis, G., Beneka, A., & Godolias, G. (2004). *Proprioceptive training (balance exercises) reduces lower extremity injuries in young soccer players*. Journal of Back and Musculoskeletal Rehabilitation, 17(3, 4), 101-104.

Manoel, M. E., Harris-Love, M. O., Danoff, J. V., & Miller, T. A. (2008). *Acute effects of static, dynamic, and proprioceptive neuromuscular facilitation stretching on muscle power in women*. Journal of strength and conditioning research, 22(5), 1528-1534.  
doi:10.1519/JSC.0b013e31817b0433 [doi]

Martin, D., & Lehnertz, K., (2001). *Manual de metodología del entrenamiento deportivo*. Barcelona: Paidotribo.

Martin, D., Carl, K., & Lehnertz, K. (2001). *Manual de metodología del entrenamiento deportivo*. Barcelona: Paidotribo

Massó, N., Rey, F., Romero, D., Gual, G., Costa, L., & Germán, A. (2010). *Surface electromyography applications*. Apunts Medicina de l' Esport (English Edition), 45(166),



127-136.

Matveev, L. (1983). *El Proceso Pedagógico del Entrenamiento Deportivo*. Buenos Aires: Stadium.

Matveev, L. (1985). *Fundamentos del entrenamiento deportivo*. Barcelona: Martínez Roca.

Matveiev, L. (2001). *Teoría general del entrenamiento deportivo*. Barcelona: Paidotribo.

Maughan, R., Harmon, M., Leiper, J., Sale, D., & Delman, A. (1986). *Endurance capacity of untrained males and females in isometric and dynamic muscular contractions*. European journal of applied physiology and occupational physiology, 55(4), 395-400.

Mayhew, J. L., Ball, T. E., Arnold, M. D., & Bowen, J. C. (1992). *Relative Muscular Endurance Performance as a Predictor of Bench Press Strength in College Men and Women*. The Journal of Strength & Conditioning Research, 6(4), 200-206.

McDougall, J., Elder, G., Sale, D., Moroz, J., & Sutton, J. (1980). *Effects of strength training and immobilization on human muscle fibres*. European journal of applied physiology and occupational physiology, 43(1), 25-34.

Meinel K., & Schnabel, G. (1988). *Teoría del movimiento..Motricidad deportiva*. Buenos Aires: Stadium.

Meléndez, A. (1995). *Entrenamiento de la resistencia aeróbica*. Madrid: Alianza.

Menshikov, V., & Volkov, N. (1990). *Bioquímica*. Moscú: Vneshtorgizdat.

Mirella, R. (2006). *Las nuevas metodologías del entrenamiento de la fuerza, la resistencia, la velocidad y la flexibilidad*. Barcelona: Paidotribo.

Moreno, J., & Rodríguez, P. (1996). *Diseños de programas de salud en actividades acuáticas*. Deporte y salud: natación y vela, , 121-133.

Morrow, S. (2005). *Quality and trustworthiness in qualitative research in counseling psychology*. Journal of counseling psychology, 52(2), 250.

Mündel, T., King, J., Collacott, E., & Jones, D. A. (2006). *Drink temperature influences fluid intake and endurance capacity in men during exercise in a hot, dry environment*. Experimental physiology, 91(5), 925-933.



Naclerio, F. (2010) *Entrenamiento Deportivo. Fundamentos y aplicaciones en diferentes deportes*. Barcelona: Panamericana.

Nashner, L. (1993). *Practical biomechanics and physiology of balance*. Handbook of balance function testing, , 261-279.

Navarro, F. (1995). *Una nueva propuesta metodológica para el entrenamiento en deportes cílicos: un ejemplo en natación*. Infocoes, I, 3-9.

Navarro, F. (1998). *Entrenamiento de la Resistencia*. Madrid: Gymnos.

Navarro, F., Castañón, F., & Gaia, A. (2003). *El entrenamiento del nadador joven*. Madrid: Gymnos.

Neiger, H. (2007). *Estiramientos analíticos manuales*. Madrid: Panamericana.

Nelson, A., & Kokkonen, J. (2001). *Acute ballistic muscle stretching inhibits maximal strength performance*. Research quarterly for exercise and sport, 72(4), 415-419.

Nelson, A., & Kokkonen, J. (2007). *Stretching anatomy*. Chicago: Human kinetics.

Nelson, A., Driscoll, N., Landin, D., Young, M., & Schexnayder, I. (2005). *Acute effects of passive muscle stretching on sprint performance*. Journal of sports sciences, 23(5), 449-454.

Noakes, T. D. (2003). *The forgotten Barcroft/Edholm reflex: potential role in exercise associated collapse*. British journal of sports medicine, 37(3), 277-278.

Norris, C. (1996). *La flexibilidad. Principios y práctica*. Barcelona: Paidotribo.

NSCA (2007). *Principios del Entrenamiento de la Fuerza y del Acondicionamiento Físico*. 2<sup>a</sup>ed. Madrid: Panamericana.

Ortiz, V. (1996). *Entrenamiento de fuerza y explosividad para la actividad física y el deporte de competición*. Barcelona: INDE.

Panjabi, M. M. (1992). *The stabilizing system of the spine*. Part I. Function, dysfunction, adaptation, and enhancement. Journal of spinal disorders & techniques, 5(4), 383-389

Patton, N., & Mortensen, O. (1971). An electromyographic study of reciprocal activity of muscles. The Anatomical Record, 170(3), 255-268.

Petibois, C., Cazorla, G., Poortmans, J. R., & Deleris, G. (2002). *Biochemical aspects of*



*overtraining in endurance sports: a review.* Sports medicine (Auckland, N.Z.), 32(13), 867-878.  
doi:321305 [pii]

Platonov, V. (1988). *El entrenamiento deportivo, teoría y metodología.* Barcelona: Paidotribo.

Platonov, V. (2001). *Teoría general del entrenamiento deportivo olímpico.* Barcelona:  
Paidotribo.

Platonov, V.N. (1991). *El entrenamiento deportivo. Teoría y metodología.* Barcelona: Paidotribo

Platonov, V.N. (1994). *La adaptación en el deporte.* Barcelona: Paidotribo.

Platonov, V.N. ,& Bulatova, M.M. (1993). *La preparación física.* Barcelona: Paidotribo.

Porta, J. (1987). *El desarrollo de las capacidades físicas: la flexibilidad.* Apunts: Educación  
Física y Deportiva, 7, 10-19.

Pradet, M. (1999). *La preparación física.* Barcelona: Inde.

Prentice, W. (1994). *Maintaining and improving flexibility.* Rehabilitation Techniques in Sports  
Medicine, , 42-45.

Riera, J. (1989). *Fundamentos del aprendizaje de la técnica y la táctica deportivas.* Barcelona:  
INDE.

Rius, J. (1995). *Formación de jóvenes deportistas.* Madrid: Pedagógicas

Robertson, R. J., Goss, F. L., Rutkowski, J., Lenz, B., Dixon, C., Timmer, J., . . . Andreacci, J. (2003). *Concurrent validation of the OMNI perceived exertion scale for resistance exercise.* Medicine and Science in Sports and Exercise, 35(2), 333-341.  
doi:10.1249/01.MSS.0000048831.15016.2A

Rodríguez, P. (2007). *Fuerza, su clasificación y pruebas de valoración.* Revista de la Facultad  
de Educación, Universidad de Murcia, , 2-10.

Román, J., Sánchez, F., & Torrescusa, L. (1989). *Iniciación al Balonmano.* Madrid: Gymnos.

Romero, D., & Tous, J. (2010). *Prevención de lesiones en el deporte. Claves para un  
rendimiento deportivo óptimo.* Madrid: Panamericana.

Ruff, R., Light, R., & Evans, R. (1987). *The Ruff Figural Fluency Test: a normative study with*



adults. *Developmental neuropsychology*, 3(1), 37-51.

Ruiz, A. (1990). *Fuerza y Musculación: "Sistemas de Entrenamiento"*. Lleida: Agonos.

Ruiz, L. (1994). *Deporte y aprendizaje: procesos de adquisición y desarrollo de habilidades*. Madrid: Visor.

Sale, D., Martin, J., & Moroz, D. (1992). *Hypertrophy without increased isometric strength after weight training*. European journal of applied physiology and occupational physiology, 64(1), 51-55.

Sánchez-Ibáñez, J. (1993). *Dinamometría muscular isocinética*. Fisioterapia, 15, 67-78.

Saunders, M., Mark, D., & Todd, M. (2004). *Effects of a carbohydrate-protein beverage on cycling endurance and muscle damage*. Medicine and Science in Sports and Exercise, 36(7), 1233-1238.

Scherrer, J. (1990). *La fatiga*. Barcelona: Paidotribo.

Schmidtblicher, D. (1987). *Applying the theory of strength development*. Track Field Q Rev, 87(3), 34-44.

Schmitt, L., Millet, G., Robach, P., Nicolet, G., Brugniaux, J. V., Fouillot, J., & Richalet, J. (2006). *Influence of "living high-training low" on aerobic performance and economy of work in elite athletes*. European journal of applied physiology, 97(5), 627-636.

Selye, H. (1954). *Síndrome general de adaptación y enfermedades de adaptación*. Endocrinología, La Habana.

Shields, N., Taylor, N., & Dodd, K. (2008). *Effects of a community-based progressive resistance training program on muscle performance and physical function in adults with Down syndrome: a randomized controlled trial*. Archives of Physical Medicine and Rehabilitation, 89(7), 1215-1220.

Shrier, I. (1999). *Stretching before exercise does not reduce the risk of local muscle injury: a critical review of the clinical and basic science literature*. Clinical Journal of Sport Medicine, 9(4), 221-227.

Shrier, I. (2002). *Does stretching help prevent injuries*. Evidence-based sports medicine, 9, 43-47.

Shrier, I., Boivin, J. F., Steele, R. J., Platt, R. W., Furlan, A., Kakuma, R., . . . Rossignol, M. (2007).



*Should meta-analyses of interventions include observational studies in addition to randomized controlled trials? A critical examination of underlying principles.* American Journal of Epidemiology, 166(10), 1203-1209. doi:kwm189 [pii]

Siff, M., & Verkhoshansky, Y. (2004). *Superentrenamiento*. Barcelona: Paidotribo.

Skrypnik, D., Bogdanski, P., Madry, E., Pupek-Musialik, D., & Walkowiak, J. (2014). *Effect of physical exercise on endothelial function, indicators of inflammation and oxidative stress.* [Wpływ wysiłku fizycznego na funkcje srodblonka, wskazniki stanu zapalnego i stresu oksydacyjnego] Polski merkuriusz lekarski : organ Polskiego Towarzystwa Lekarskiego, 36(212), 117-121.

Smith, J. A., Martin, D. T., Telford, R. D., & Ballas, S. K. (1999). *Greater erythrocyte deformability in world-class endurance athletes.* The American Journal of Physiology, 276(6 Pt 2), H2188-93.

Solana, M. (2007). *Los estiramientos: apuntes metodológicos para su aplicación.* Aloma: revista de psicología, ciències de l'educació i de l'esport Blanquerna, (21), 203-221.

Sölvesson, S. (1989). *Stretching*. Barcelona: Martínez Roca.

Sperlich, B., Achtzehn, S., de Marees, M., von Papen, H., & Mester, J. (2016). *Load management in elite German distance runners during 3-weeks of high-altitude training.* Physiological reports, 4(12), 10.14814/phy2.12845. doi:10.14814/phy2.12845 [doi]

Staron, R., Hagerman, F., Hikida, R., Murray, T., Hostler, D., Crill, M., . . . Toma, K. (2000). *Fiber type composition of the vastus lateralis muscle of young men and women.* The journal of histochemistry and cytochemistry : official journal of the Histochemistry Society, 48(5), 623-629.

Stone, M., & Stone, M. (2005). *Recuperación–Adaptación: Deportes de Fuerza y Potencia.* PubliCE Standard.

Stone, M., Ramsey, M., Kinser, A., O'Bryant, H., Ayers, C., & Sands, W. (2006). *Stretching: Acute and Chronic? The Potential Consequences.* Strength & Conditioning Journal, 28(6), 66-74.

Tous, J. (1999). *Nuevas tendencias en el entrenamiento de musculación.* Barcelona: Paidotribo.

Trojan, T., y McKeag, D. (2006). *Single leg balance test to identify risk of ankle sprains.* British Journal of Sports Medicine, 40(7), 610-3; discussion 613. doi:10.1136/bjsm.2005.024356

Vales, A., Sambade, J., & Areces, A. (2002). *Directrices metodológicas para el entrenamiento*



*del portero de fútbol en etapas de Alto Rendimiento: aspectos físicos condicionales.*  
Rev.Training-Fútbol, 77, 16-25.

Vasconcelos, A. (2000). *Planificación y organización del entrenamiento deportivo*. Barcelona: Paidotribo.

Verdugo, M. (2007). *Entrenamiento de la Resistencia*. Barcelona: Paidotribo.

Verjoshanski, I. (1990). *Entrenamiento deportivo: planificación y programación*. Barcelona: Ediciones Martínez Roca.

Villa, J., & García-López, J. (2003). *Tests de salto vertical (I): Aspectos funcionales*. Revista digital: Rendimiento deportivo.com, 6, 1-14.

Vinuesa, M., & Coll, J. (1987). *Teoría básica del estiramiento*. Madrid: Esteban Sanz.

Viru, A. (1995). *Mecanismos de adaptación biológica y entrenamiento*. Red: revista de entrenamiento deportivo, 9(2), 5-11.

Volkov, M. (1984). *Los procesos de recuperación en el deporte*. Buenos Aires: Stadium.

Wasserman, K., Van Kessel, A., & Burton, G. (1967). *Interaction of physiological mechanisms during exercise*. J Appl Physiol, 22(1), 71-85.

Weineck, J. (1988). *Entrenamiento de la resistencia general en niños y adolescentes*. Entrenamiento óptimo: Cómo lograr el máximo rendimiento, 140-160.

Weineck, J. (2005). *Entrenamiento total*. Barcelona: Paidotribo.

Wessel, J., & Wan, A. (1994). *Effect of stretching on the intensity of delayed-onset muscle soreness*. Clinical Journal of Sport Medicine, 4(2), 83-87.

Winnick, J. (1995). *Adapted physical education du sport*. Champaign: Human Kinetics.

Wood, T., Maddalozzo, G., & Harter, R. (2002). *Accuracy of seven equations for predicting 1-RM performance of apparently healthy, sedentary older adults*. Measurement in physical education and exercise science, 6(2), 67-94.

Ylinen, J., Kankainen, T., Kautiainen, H., Rezasoltani, A., Kuukkanen, T., & Häkkinen, A. (2009). *Effect of stretching on hamstring muscle compliance*. Journal of Rehabilitation Medicine, 41(1), 80-84.



Yoshihara, K., Shirai, Y., Nakayama, Y., & Uesaka, S. (2001). *Histochemical changes in the multifidus muscle in patients with lumbar intervertebral disc herniation*. Spine, 26(6), 622-626.

Zatsiorsky, V. (1965). *Transfer of training results in motor tasks*. Coordination of motor and autonomous functions during human physical activity, , 117-133.

Zatsiorsky, V., & Kraemer, W. (2006). *Science and practice of strength training*. USA: Human Kinetics.

Zintl, F. (1991). *Entrenamiento de la resistencia*. Barcelona: Martínez Roca.



## Addendum to the Course Guide of the Subject

Due to the exceptional situation caused by the health crisis of the COVID-19 and taking into account the security measures related to the development of the educational activity in the Higher Education Institution teaching area, the following changes have been made in the guide of the subject to ensure that Students achieve their learning outcomes of the Subject.

**Situation 1: Teaching without limited capacity (when the number of enrolled students is lower than the allowed capacity in classroom, according to the security measures taken).**

In this case, no changes are made in the guide of the subject.

**Situation 2: Teaching with limited capacity (when the number of enrolled students is higher than the allowed capacity in classroom, according to the security measures taken).**

In this case, the following changes are made:

### 1. Educational Activities of Onsite Work:

All the foreseen activities to be developed in the classroom as indicated in this field of the guide of the subject will be made through a simultaneous teaching method combining onsite teaching in the classroom and synchronous online teaching. Students will be able to attend classes onsite or to attend them online through the telematic tools provided by the university (videoconferences). In any case, students who attend classes onsite and who attend them by videoconference will rotate periodically.

In the particular case of this subject, these videoconferences will be made through:



Microsoft Teams



Kaltura



### **Situation 3: Confinement due to a new State of Alarm.**

In this case, the following changes are made:

#### **1. Educational Activities of Onsite Work:**

All the foreseen activities to be developed in the classroom as indicated in this field of the guide of the subject, as well as the group and personalized tutoring, will be done with the telematic tools provided by the University, through:



Microsoft Teams



Kaltura

Explanation about the practical sessions:



## 2. System for Assessing the Acquisition of the competences and Assessment System

### ONSITE WORK

#### Regarding the Assessment Tools:



The Assessment Tools will not be modified. If onsite assessment is not possible, it will be done online through the UCVnet Campus.



The following changes will be made to adapt the subject's assessment to the online teaching.

Course guide		Adaptation	
Assessment tool	Allocated percentage	Description of the suggested changes	Platform to be used

The other Assessment Tools will not be modified with regards to what is indicated in the Course Guide.

#### Comments to the Assessment System: