

國立體育大學授課教學大綱 (Teaching Plan)

科目中文名稱 Chinese Course Title	運動科學實務與應用 (二)
科目英文名稱 English Course Title	Sport Science Practicum and Application (II)
授課老師 Instructor	Jackson Pui Man Wai 衛沛文
修課條件 Prerequisite	Undergraduate level courses in anatomy, human physiology, and exercise physiology are required. Students with deficiency in prerequisite courses are required to obtain permission from the course instructor.
教學目標 Objective	At the end of this semester, students will be able to: (1) understand the principle of instrumentation and method of measurements of selected areas in the field of exercise physiology research, and (2) Perform laboratory and field tests in the assessment of anaerobic capacity, respiratory functions, muscular functions, anthropometry (body dimension) and body composition.
先修科目 Pre Course	“ see prerequisite”
教材內容 Outline	Anaerobic Capacity: Measurement of anaerobic threshold, maximum anaerobic power test (Wingate test, running stair test, vertical jump test, maximum oxygen deficit test (treadmill test). Respiratory functions: Measurement of tidal volume, vital capacity, forced expiratory volume, forced expiratory flow Muscular strength: Measurement of isometric strength (maximum voluntary contraction, MVC), dynamic strength (one repetition maximum, 1 RM), and isokinetic strength (peak torque). Anthropometry: Measurement of body status, weight, body circumferences, skeletal diameter and width, Body composition: Measurement by methods of densitometry, dual x-ray absorptiometry (DXA), bioimpedance (BIA), skinfold thickness, body circumference, and body mass index (BMI).
教學方式 Teaching Method	Classroom instructions, demonstration and hand-on experimental work, scientific writing, and written examinations.

參考書目 References	Major Reference books (1) Adams GM. Exercise Physiology Laboratory Manual. Wm. C. Brown. 1990. (2) Cooper CB and Storer TW. Exercise testing and interpretation. Cambridge University Press. 2001. (3) Nieman DC. <i>Exercise Testing and Prescription: A Health-Related Approach.</i> New York, NY: McGraw Hill, 2003. (4) Heywood VA. <i>Advanced Fitness Assessment and Exercise Prescription, 4th ed.</i> Champaign, IL: Human Kinetics, 2002. Other reference Books and Reports 1. American College of Sports Medicine. <i>ACSM's Health-Related Physical Fitness Assessment Manual</i>, 2nd edition, Lippincott Williams & Wilkis, 2008. 2. American College of Sports Medicine. <i>ACSM's Resources Manual for Guidelines for Exercise Testing and Prescription, 5th edition.</i> Baltimore, Maryland: Lippincott Williams & Wilkis, 2005. 3. Åstrand P.-O. and Rodahl K. <i>Textbook of Work Physiology.</i> New York: McGraw-Hill, 1986. 4. Baumgartner TA and Jackson AS. <i>Measurement for Evaluation in Physical Education and Exercise Science.</i> Boston: WCM/McGraw-Hill, 1999. Research Papers 1. Bar-Or O. The Wingate anaerobic test. An update on methodology, reliability and validity. <i>Sports Med</i> 4: 381-394, 1987. 2. Clarkson P.M., Kroll W., and McBride T.C. Maximal isometric strength and fiber type composition in power and endurance athletes. <i>Eur J Appl Physiol.</i> 44:35-42, 1980. 3. Durnin J.V.G.A. and Womersley J. Body fat assessed from total body density and its estimation from skinfold thickness: measurements on 481 men and women aged from 16 to 72 years. <i>Br. J. Nutr.</i> 32: 77-97, 1974. 4. Granier P., Mercier B., Mercier J., Anselme F., and Preaut. Aerobic and anaerobic contribution to Wingate test performance in sprint and middle-distance runners. <i>Eur. J. Appl. Physiol.</i> 70: 58-65, 1995. 5. Janz K.F. et al. Cross validation of the Slaughter skinfold equations for children and adolescents. <i>Med Sci Sports Exerc.</i> 25(9): 1070-1076, 1993. 6. Lim T.P.K. and Luft U.C. Body density, fat and fat-free weight. <i>Amer. J. Med.</i> 30: 825-832, 1961. 7. Scott CB, Roby FB, Lohman TG, and Bunt JC. The maximally accumulated oxygen deficit as an indicator of anaerobic capacity. <i>Med Sci Sports Exerc</i> 23(5): 618-624, 1991. 8. Sung RYT, Lau P, Yu CW, Lam PKW, Nelson EAS. Measurement of body fat using leg to leg bioimpedance. <i>Arch Dis Child.</i> 85: 263-267, 2001.
教學進度 Syllabi	請詳載 18 週授課內容 (Teaching contents in 18 weeks) Week 1-3 Anaerobic capacity Week 4-6 Respiratory functions Week 7-9 Muscular functions Week 10 Mid-term examination Week 11 Anthropometry Week 12-17 Body composition Week 18 Final examination
評量方式 Evaluation	評量方式與百分比 (Method and percentage) Laboratory (Scientific) reports (50%) Mid-term examination (20%) Final examination (30%)

注意事項：

1.課程之中英文名稱請依各開課單位學分科目表填寫。

2.本表各欄位如有不足，請自行增列後填寫。

Core Ability Rubric

Core ability	%	Course objectives	Level of skill	Teaching strategy	Evaluation method
1. 具備運用運動生理、運動營養與運動科技知識的能力	30	Demonstrate understandings and application of the context of course material	Academic skill	- Classroom instructions - Laboratory / field work - Stimulation of thinking	- Scientific reports - Written examinations
2. 具備分析與解決運動科學相關問題的能力	30	- Can identify problem types. - Understands the level of complexity of a problem - Develop, evaluate, and test possible solutions	Analytical skill	- Classroom instructions - Encourage Critical thinking - Scientific writing skills	- Problem solving in scientific reports - Written examinations
3. 具備運動科學專業文獻 (含外語) 之閱讀、寫作及發表 (含外語) 的能力	20	- Able to search, identify, screen, and implement research literatures - Able to write a concise and comprehensible scientific report	Integrative skill	- Classroom instructions - Scientific writing skills - Citation methods	- Scientific reports - Citation of SCI literatures
4. 具備運動科學研究之團隊合作與溝通能力	20	- Joins a group cooperatively. - Acknowledge and listens attentively to other members - Be prepared and reliable - Contribute to the end product. - Respect differing points of view - Can take an active position	Practical and social skill	- Classroom instructions - Laboratory / field work - Scientific writing skills	Scientific reports – successful completion of all experiments

Scientific Report Rubric (50% of course evaluation)

	Poor 1-4	Average 5-6	Good 7-8	Excellence 9-10	Score
Introduction (10%)	Does not give any information about what to expect in the report.	Gives very little information	Gives too much information	Presents a concise lead-in to the report	
Answers to the issues (60%)	Answers does not related to the issues.	Answers only slightly related to the issues	Answers are somewhat related to the issues	Answers are directly related to the issues	
Conclusion (10%)	Presents an illogical explanation and does not address any of the questions being asked	Presents an illogical explanation and addresses few questions	Presents a logical explanation and addresses some of the questions	Presents a logical explanation and addresses most of the questions	
Grammar & Spelling, Attractiveness, Timeliness (20%)	- Very frequent grammar and/or spelling errors - Illegible writing, loose pages, no page numbering, no student name - Report handed in more than one day late - No references cited	- More than two errors. - Legible writing, some ill-formed letters, print too small or too large, wrong page numbering, papers stapled together. - Report handed in up to two hours late - References cited but only a few SCI	- Only one or two errors. - Legible writing, well-formed characters, clean and neatly bound in a report cover, illustrations provided - Report handed in up to one hour late - Mostly SCI references	- All grammar and spelling are correct - Word processed or typed, clean and neatly bound in a report cover, illustrations provided - Report handed in on time. - All SCI references	
				Total (max. 100)	