

國立體育大學授課教學大綱 (Teaching Plan)

科目中文名稱 Chinese Course Title	應用運動生理學研究
科目英文名稱 English Course Title	Advanced Applied Exercise Physiology
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, student will be able to: (1) Construct knowledge model of special issue in exercise physiology by extensive and in-depth literature review for promotion of physical activity in the prevention and management of chronic non-communicable disease, or enhancement of sport performance. (2) Complete an evidence-based review paper and perform a professional oral presentation.
先修科目 Pre Course	“ see prerequisite”
教材內容 Outline	Bone growth and modeling: Hormonal regulation of calcium and phosphate balance, bone resorption and deposition, 1,25-dihydroxyvitamin D3 and bone mineral, mechanical loading on bone growth and mineral content. Assessment of bone mineral content and density: dual x-ray absorptometry method. Osteoporosis criteria: WHO's definition of osteoporosis for postmenopausal women, criteria for premenopausal women and for men. Exercise and osteoporosis: Physical activity, resistance exercise training, weight-bearing activity, impact exercise, grip strength, adipose tissue, and bone mineral density. Physical activity for glycemic control among type 2 diabetes: Aerobic exercise, walking, resistance exercise programs. Chronic kidney disease (CKD): Prevalence, etiology, physical inactivity and CKD, physical activity and renal cell cancer, association of physical activity and mortality among CKD.
教學方式 Teaching Method	Classroom instructions and seminars

參考書目 References	References Bone Health, Physical Activity, and Obesity 1. Asomaning, K. The association between body mass index and osteoporosis in patient referred for a bone mineral density examination. <i>J Women's Health</i>, 15(9): 1028-1034, 2006 2. Bailey DA, Mckay HA, Mirwald RL, Crocker PR and Faulkner RA. A six-year longitudinal study of the relationship of physical activity to bone mineral accrual in growing children: the university of Saskatchewan bone mineral accrual study. <i>JBMR</i> 14(10): 1672-1679, 1999.. 3. Bergmann P, et al. Loading and skeletal development and maintenance. <i>J Osteoporosis</i>, 2011 4. Bianchi ML, Baim S, Bishop NJ, Gordon CM, Hans DB, Langman CB, Leonard MB and Kalkwarf HJ. Official positions of the international society for clinical densitometry (ISCD) on DXA evaluation in children and adolescents. <i>Pediatr Nephrol</i> 25(1): 37-47, 2010. 5. Binkovitz LA and Henwood MJ. Pediatric DXA: technique and interpretation. <i>Pediatr Radiol</i> 37(1): 21-31, 2007. 6. Boot AM, de Ridder MA, Pols HA, Krenning EP and de Muinck Keizer-Schrama SM. Bone mineral density in children and adolescents: relation to puberty, calcium Intake, and physical activity. <i>J Clin Endocrinol Metab</i> 82(1): 57-62, 1997. 7. Borer KT. Physical activity in the prevention and amelioration of osteoporosis in women : interaction of mechanical, hormonal and dietary factors. <i>Sports Med</i> 35(9): 779-830, 2005. 8. Cao JJ, Effect of obesity on bone metabolism. <i>Journal of Orthopaedic Surgery Res.</i>6:30, 2011 9. Chan DC, Lee WT, Lo DH, Leung JC, Kwok AW and Leung PC. Relationship between grip strength and bone mineral density in healthy Hong Kong adolescents. <i>Osteoporos Int</i> 19(10): 1485-1495, 2008. 10. Cheung CL, Tan KCB, Bow CH, Soong CSS, Loong C HN and Kung AWC. Low handgrip strength is a predictor of osteoporotic fractures cross-sectional and prospective evidence from the Hong Kong Osteoporosis Study. <i>AGE DOI</i> 10.1007/s11357-011-9297-2, 2011. 11. Conference, W. G. f. t. I. P. D.. Diagnosis of osteoporosis in men, premenopausal women, and children. <i>J Clin Densitom</i> 7(1): 17-26, 2004. 12. Dixon WG, Lunt M, Pye SR, Reeve J, Felsenberg D, Silman AJ and O'Neill TW. Low grip strength is associated with bone mineral density and vertebral fracture in women. <i>Rheumatology</i> 44(5): 642-646, 2005. 13. Greene DA, et al. Adaptive skeletal responses to mechanical loading during adolescence. <i>Sport Med</i>, 36(9): 723-732, 2006 14. Gunnar BJ, The burden of musculoskeletal diseases in the united states: osteoporosis and bone health. <i>Am Academy Orthopaedic Surgeons</i>, 2008 15. Hage REI. Total body, lumbar spine and hip bone mineral density in overweight adolescent girls: decrease or increased? <i>J Bone Miner Metab</i>, 27: 629-633, 2009 16. Hong X, et al. Percent fat mass is inversely associated with bone mass and hip geometry in rural chinese adolescents. <i>J Bone Min Res</i>, 25(7): 1544-1554, 2010 17. Leslie A, et al. Hormonal determinants and disorders of peak bone mass in children. <i>J Clin Endocrinol & Metba</i>, 85(11): 3951-3963, 2000 18. World Health Organization. WHO scientific group on the assessment of osteoporosis at primary health care level. WHO, 2004 19. Zhao L-J, et al. Correlation of obesity and osteoporosis: effect of fat mass on the determination of osteoporosis. <i>J Bone Min Res.</i> 23: 17-29, 2008 Exercise intervention on glycemic control among type 2 diabetes 1. Araiza P, Hewes H, Gashetewa C, Vella CA and Burge MR. Efficacy of a pedometer-based physical activity program on parameters of diabetes control in type 2 diabetes mellitus. <i>Metabolism</i> 55(10):1382-7, 2006. 2. Di Loreto C, Fanelli C, Lucidi P, Murdolo G, De Cicco A, Parlanti N, Ranchelli A, Fatone C, Taglioni C, Santeusano F and De Feo P. Make your diabetic patients walk: long-term impact of different amounts of physical activity on type 2 diabetes. <i>Diabetes</i>
----------------------------	---

	<i>Care</i> 28(6):1295-302, 2005. 3. Marcus RL, Smith S, Morrell G, Diddle ALE, Stice DW and LaStayo PC. Comparison of combined aerobic and high- force eccentric resistance exercise with aerobic exercise only for people with type 2 diabetes. <i>PTJ</i> 88(11): 1345 – 1353, 2008. 4. Negri C, Bacchi E, Morgante S, Soave D, Marques A, Menghini E, Muggeo M, Bonora E and Moghetti. Supervised walking groups to increase physical activity in type 2 diabetic patients. <i>Diabetes Care</i> 33(11):2333-5. 5. Praet SF, van Rooij ES, Wijtliet A, Boonman-de Winter LJ, Enneking T, Kuipers H, Stehouwer CD and van Loon LJ. Brisk walking compared with an individualised medical fitness programme for patients with type 2 diabetes: a randomised controlled trial. <i>Diabetologia</i> 51(5):736-46, 2008. 6. Signal RJ, Kenny GP, Boule NG, Wells GA, Prudhomme D, Fortler, Reld RD, Tulloch H, Coyle D, Phillips P, Jennings A and Jaffey J. Effects of aerobic training, resistance training, or both on glycemic control in type 2 diabetes: a randomized trial. <i>Ann Intern Med</i> 147(6): 357 – 369, 2007. 7. Trenell MI, Hollingsworth KG, Lim EL and Taylor R. Increased daily walking improves lipid oxidation without changes in mitochondrial function in type 2 diabetes. <i>Diabetes Care</i> 31(8):1644-9, 2008. 8. Umpierre D, Ribeiro PAB, Kramer CK, Leitão CB, Zucatti ATN, Azevedo MJ, Gross JL, Ribeiro JP, Schaan BD. Physical activity advice only or structured exercise training and association with HbA1c lLevels in type 2 dDiabetes: a systematic review and meta-analysis. <i>JAMA.</i> 305(17):1790-1799, 2011. 9. Walker KZ, Piers LS, Putt RS, Jones JA and O'Dea K. Effects of regular walking on cardiovascular risk factors and body composition in normoglycemic women and women with type 2 diabetes. <i>Diabetes Care</i> 22(4):555-61, 1999. 10. Yates T, Davies M, Brady E, Webb D, Gorely T, Bull F, Talbot D, Sattar N and Khunti K. Walking and inflammatory markers in individuals screened for type 2 diabetes. <i>Prev Med</i> 47(4):417-21, 2008. 11. Yates T, Davies MJ, Gorely T, Talbot D, Bull F, Sattar N and Khunti K. The effect of increased ambulatory activity on markers of chronic low-grade inflammation: evidence from the PREPARE programme randomized controlled trial. <i>Diabet Med</i> 27(11):1256-63, 2010. Chronic kidney disease and physical activity 1. Beddhu S, Baird BC, Zitterkoph J, Neilson J, and Greene T. Physical activity and mortality in chronic kidney disease (NHANES III). <i>Clin J Am Soc Nephrol.</i> 2009. doi: 10.2215/CJN.01970309 2. Bergstrom A, et al. Physical activity and risk of renal cell cancer. <i>Int. J. Cancer:</i> 92, 155–157 (2001) 3. Biruh T Workeneh and William E Mitch. Review of muscle wasting associated with chronic kidney disease. <i>Am J Clin Nutr.</i> 91: 1128S-1132S, 2010. 4. Wen CP, et al. All-cause mortality attributable to chronic kidney disease: a prospective cohort study based on 462 293 adults in Taiwan. <i>The Lancet.</i> 371: 2173-82, 2008. 5. White SL, Dunstan DW, Polkinghorne KR, Atkins RC, Cass A, Chadban SJ. Physical inactivity and chronic kidney disease in Australian adults: The AusDiab study. <i>Nutr Metab Cardiovasc Dis.</i> Nov 24, 2009.
教學進度 Syllabi	請詳載 18 週授課內容 (Teaching contents in 18 weeks) Week 1-3: Bone growth and modeling Week 4-5: Assessment of bone mineral content and density, osteoporosis criteria Week 6-9: Exercise and osteoporosis Week 10: Mid-term paper Week 11-14: Physical activity for glycemic control among type 2 diabetes Week 15-17: Physical activity and chronic kidney disease (CKD)

	Week 18: Oral presentation and term paper
評量方式 Evaluation	評量方式與百分比 (Method and percentage) Oral presentation (40%) Mid-term paper (20%) Term paper (40%)

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	0				
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 - Guiding writing skills and oral presentation skills	Integration of empirical evidence and construction of a knowledge model
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	30	- Able to search, identify, screen, and implement research literatures - Able to write a concise and comprehensible term paper	Integrative skill	- Classroom instructions on effective speaking and visual aid - Instructions on effective writing	- Oral presentation - Term paper
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	Guiding and encourage queries and exchange of concepts and opinions in class seminars or other academic activities	Participation and performance of group discussions in seminars or other academic activities
5. 具備運動科學國際觀	20	- Student is able to understand English research literatures - Student is able to appreciate the role of important research findings in the current model of knowledge - Student is aware and able to analyze multiple and diverse sources and viewpoints of information and compare and evaluate according to specific criteria appropriate for the discipline	Integrative skill	Classroom Instructions on screening and extraction of important evidence through extensive search and reading of international (English) research literatures	Appropriately support line of thoughts and points of view by citing international literatures in oral presentation and term paper

Term Paper Rubric (60% of course evaluation)

Criteria	Poor 1-4	Average 5-6	Good 7-8	Excellence 9-10	Score
Ideas (20%)	- Does not have a clear central idea or does not respond appropriately to the assignment. - Too vague or obvious to be developed effectively - May misunderstand sources	- Adequate but weaker and less effective, responding less well to the assignment. - Presents central idea in general terms, often depending on platitudes or cliches. - Usually does not acknowledge other views. - Shows basic comprehension of sources, with lapses in understanding	- Responding appropriately to assignment - Clearly states a central idea, have minor lapses in development. - Begins to acknowledge the complexity of central idea and the possibility of other points of view. - Shows careful reading of sources, but may not evaluate them critically.	- Excels in responding to assignment - Demonstrates sophistication of thought - Central idea is clearly communicated and worth developing - Recognizes some complexity, knowledge contradictions, or limits - Understands and critically evaluates its sources	
Organization & coherence (30%)	- Lacking internal paragraph coherence and using few or inappropriate transitions - Paragraphs lack topic sentences or main ideas, or too general or too specific to be effective - Paragraphs not all relate to paper's theme	- Ideas are arranged with some evident logical structure - May use transitions, but they may not logic-based - Paragraph may relate to central idea, but logic is not always clear - Topic sentences may be overly general, and sentence arrangement may lack coherence	- Shows a logical progression of ideas and uses fairly sophisticated transitional devices; e.g., may move from least to more important idea - Some logical links may be faulty, but each paragraph clearly relates to paper's central idea.	- Uses a logical structure appropriate to paper's subject, purpose, audience, thesis, and disciplinary field. - Sophisticated transitional sentences often develop one idea from the previous one or identify their logical relations - It guides the reader through the chain of reasoning or progression of ideas.	
Support (30%)	- Depends on cliches or overgeneralizations for support, or offers little evidence of any kind. - Personal narrative rather than essay, or summary rather than analysis.	- Often uses generalizations to support its points. May use examples, but they may be obvious or not relevant. - Often depends on unsupported opinion or personal experience, or assumes that evidence speaks for itself and needs no application to the point being discussed.	- Begins to offer reasons to support its points, perhaps using varied kinds of evidence - Begins to interpret the evidence and explain connections between evidence and main ideas. - Its examples bear some relevance.	Uses evidence appropriately and effectively, providing sufficient evidence and explanation to convince.	
Style and mechanics (20%)	- Vague and abstract, or too personal and specific - Usually contains awkward or ungrammatical sentences; sentence structure is simple or monotonous - Contains either many mechanical errors or a few important errors that may impede the reader's understanding and ability to see connections between thoughts	- Relatively vague and general words, may use some inappropriate language - Sentence structure generally correct, but sentences may be wordy, unfocused, repetitive, or confusing - Usually contains several mechanical errors, which may temporarily confuse the reader but not impede the overall understanding	- Generally uses words accurately and effectively, but may sometimes be too general - Sentences generally clear, well structured, and focused, though some may be awkward or ineffective - Contain a few errors, which may confuse the reader but not impede understanding	- Chooses words for their precise meaning and uses an appropriate level of specificity - Sentence style fits paper's audience and purpose - Sentences are varied, yet clearly, carefully focused, not long and rambling - Almost entirely free of spelling, punctuation, and grammatical errors.	
				Total (max. 100)	

Oral Presentation Rubric (40%)

Criteria	Poor 1-4	Average 5-6	Good 7-8	Excellence 9-10	Score
Organization and style (15%)	- Logic of arguments is not made clear - Listeners are confused with the organization of the material - Presentation is too elementary or too sophisticated - Information is read to audience. - Presenter is obviously anxious and cannot be heard	- Listener can follow presentation with effort. - Some arguments are not clear - Organization seems unordered - Some aspects of presentation are too elementary or too sophisticated for audience - Much of the information is read - Presenter seems uncomfortable and can be heard only if listener is very attentive	- Presentation is generally clear and well organized. - A few minor points may be confusing - Level of presentation is generally appropriate - Pacing is sometimes too fast or slow - The presenter seems slightly uncomfortable at times, and the audience occasionally has trouble hearing the presenter	- Presentation is clear, logical and organized - Listener can follow line of reasoning - Level of presentation is appropriate for the audience - Presentation is a planned conversation, paced for audience understanding, and not a reading of a paper - Speaker is clearly comfortable and can be heard by all	
Use of communication aids (PowerPoint, handouts, etc.) (15%)	No communication aids are used, or they are so poorly prepared	- Communication aids are poorly prepared or used inappropriately - Font is too small to be easily seen. - Too much information is included - Unimportant material is Highlighted - Most information is text	- Communication aids contribute to the quality of the presentation - Font size is appropriate for reading - Appropriate information is included - Some material is not supported by visual aids - Tables and figures may be utilized, but are not totally effective	- Communication aids are prepared in a professional manner: - Font on visuals is large enough to be seen by all - Details are minimized so that main points stand out - Tables and figures are well utilized to organize numbers or show complicated relation among material	
Content: depth and accuracy of content (40%)	- No reference is made to literature or theory - Information included is sufficiently inaccurate and create doubt - Listeners may have been misled	- Explanations of concepts and/or theories are inaccurate or incomplete - Little attempt is made to tie theory to practice - Errors made may distract a knowledgeable listener - Listeners may need to determine what information is reliable	- For the most part, explanations of concepts and theories are accurate and complete - Some helpful applications are included - No significant errors are made - Errors may be related to speaker's nervousness or oversight	- Provides an accurate and complete explanation of concepts and theories - Applications of theory are included - Listeners gain insights - Information and/or data is consistently accurate	
Use of language: grammar and word choice, freedom from bias (20%)	- Have apparent difficulty with grammar and vocabulary - Oral language and/or body language frequently reflects bias - Some listeners will probably be offended	- Some grammatical errors and use of slang are evident - Some sentences are incomplete/halting, and/or vocabulary is somewhat limited or inappropriate - Oral language and/or body language includes some significant bias - Listeners may be offended.	- For the most part, sentences are complete and grammatical, and they flow together easily - With a few exceptions, words are chosen for their precise meaning - Oral language and body language are free from bias with one or two minor exception.	- Sentences are complete and grammatical, and they flow together easily. Words are chosen for their precise meaning - Both oral language and body language are free from bias	
Responsiveness to audience: verbal interaction and body language (10%)	- Avoids or discourages active audience participation - Is not responsive to group - Body language reveals a reluctance to interact with audience.	- Reluctantly interacts with audience - Responds to questions inadequately - Body language reflects some discomfort when interacting with audience	- Generally responsive to audience comments and needs - Most of the time, clarifies, restates, and responds to questions, and summarizes when needed - Body language reflects comfort when interacting with audience	- Highly responsive to audience comments and needs - Consistently clarifies, restates, and responds to questions - Summarizes when needed - Body language reflects confidence and ease when interacting with audience.	
				Total (max. 100)	