

**The University of Hong Kong  
Institute of Human Performance**

**BSc. in Exercise and Health 2009-2010  
Module Outline**

<b>Course Title</b>	: Measurement (and promotion) of physical activity
<b>Code Number</b>	: PBSL2235
<b>Course web-site</b>	: via WebCT
<b>Day and Time</b>	: Wednesday 2:00 – 5:00pm
<b>Lecture Venue</b>	: LR- G15
<b>Course Lecturer</b>	: Dr. Alison McManus Office: Rm. 106, Patrick Manson Building, Sassoon Road Email: <a href="mailto:alimac@hku.hk">alimac@hku.hk</a> Tel.: 2589-0582

This course is designed for those who are interested in the measurement of physical activity and wish to learn about the science and practical aspects of current techniques used in this field of research. During the semester students will cover various methodological considerations, data collection, operational issues and the analysis & interpretation of data. A mixture of lectures, laboratory sessions and data collection experiences will be offered and there will be plenty of opportunity to get hands-on experience using monitors.

The course has a primary focus on the objective measurement of physical activity and key areas covered include the measurement of energy expenditure, heart rate and motion sensor assessment of physical activity. Subjective measurement of physical activity is introduced and course completes with consideration of physical activity promotion and future techniques.

**Objectives:**

On completion of this course, the student should be able to:

- Understand the physiological basis underlying the assessment of physical activity.
- Identify the key principles of the measurement of energy expenditure using respiratory gas analysis.
- Identify the key principles of motion sensors and apply these to assessment of physical activity.
- Identify the key principles of heart rate telemetry and apply these to assessment of physical activity.
- Be aware of various subjective instruments available for the assessment of physical activity and how the various dimensions of these affect the assessment of physical activity.

## Schedule

Week	Date	Lecture Topic	Reading Material All reading material is available on the course WebCT site.
1	Sept 2	Introduction and course logistics <b>Lecture:</b> An introduction to physical activity science	For week 2 & 3 read Scott (2008) Chapter 14 (Metabolic energy expenditure at rest). Skip the section on pregnancy.
2	Sept 9	<b>Lecture:</b> General principles of metabolism & energy expenditure	For week 3 & 4 read Scott (2008) Chapter 15 (Metabolic energy expenditure of activity)
3	Sept 16	<b>Lecture:</b> Measurement of energy expenditure 1	
4	Sept 23	<b>Lecture:</b> Measurement of energy expenditure 2 Introduction to lab work	For week 5 read: Levine Measurement of EE (2005)
5	Sept 30	<b>Lab session 1:</b> Energy expenditure at rest, standing and moving	For Week 6, 8 & 9 read Corder <i>et al.</i> Accelerometers and pedometers (2007). Also useful : Bassett <i>et al.</i> Walking and measurement (2008) Kavanagh and Menz Accelerometry (2008).
6	Oct 7	<i>Lab 1 data discussion</i> <b>Lecture:</b> Motion sensing Distribution of accelerometers / pedometers	For week 7, 8 & 9 read Acheten & Jeukendrup HR Monitoring (2003)
	Oct 14	<i>Reading Week Measurement</i>	<i>Field data collection</i>
7	Oct 21	<i>Field data collection discussion</i> <b>Lecture:</b> Estimating energy expenditure from heart rate measurement	<b>Report 1 Due.</b>
8	Oct 28	<i>Field data collection discussion</i> <b>Lab session 2 :</b> Motion sensing, heart rate & calibration	For week 10 & 11 read Kremers et al. Cognitive determinants (2005)
9	Nov 4	<b>Lab session 3 :</b> Motion sensing, heart rate & calibration	
10	Nov 11	<i>Lab 2 &amp; 3 data discussion</i> <b>Lecture:</b> Subjective measurement of physical activity 1	For week 11 read Levine NEAT. Crouching tiger, hidden dragon (2006)
11	Nov 18	<b>Lecture:</b> Subjective measurement of physical activity 2 <b>Lecture:</b> Why and how do we promote physical activity?	For week 12 read Chen & Bassett The technology of accelerometry (2005)
12	Nov 25	<b>Lecture:</b> Advances in physical activity science	<b>Report 2 Due.</b>

### Course Policies:

- Participation in class discussions is important and will improve your learning experience and the learning experience for the whole class. Being well-read and prepared are essential.
- Putting ACTIVITY into practice: **Participation in laboratory work and assessment of physical activity is compulsory. 5% will be deducted each time a laboratory session is missed or if the field data is not handed-in on time (a possible 20% deduction).**
- Punctual attendance is a basic courtesy - **those who are more than 1 hour late will be marked as absent.**
- Assessments must be received **when due** to receive full credit. **10% will be deducted** every day over-due.
- Plagiarism will result in a failing ("F") grade for the assignment. Students should familiarize themselves with the university plagiarism codes of conduct.

### Assessment:

- (i) **Report 1: Energy expenditure and its components.**  
This report must contain the data generated in lab session 1. The report will focus only on the methods and results sections (see appendix 1) and will not exceed 1000 words (excluding references). This report contributes 20% toward the final grade.  
**Report 1 due date: 21 October 2009, 9.30 am** (electronically via WebCT only  
NOT email or hardcopy)
- (ii) **Report 2: The objective assessment of physical activity: a comparison of methods.**  
This report must contain the data generated in lab sessions 2 & 3. The report contributes 30% toward the final grade. Report 2 should not exceed 1500 words (excluding references) and will follow the format that is outlined in appendix 1.  
**Report 2 due date: 25 November 2009, 9.30 am** (electronically via WebCT only  
NOT email or hardcopy)
- (iii) **Report 3: Physical activity of HKU students.**  
This report must contain the field testing data. The report contributes 50% toward the final grade. Report 2 should not exceed 1500 words (excluding references) and will follow the format that is outlined in appendix 1.  
**Report 3 due date: 16 December 2009, 9.30 am** (electronically via WebCT only  
NOT email or hardcopy)

## Appendix 1. Report Writing

Scientific reports normally contain the following clearly defined sections:

- Introduction
- Methods
- Results
- Discussion
- References

**Introduction:** The introduction will enable the reader to place the investigation in context, provide scientific evidence to back-up arguments (from journals and books NOT the web!) and state the aim of the investigation. This section should be **NO MORE than 500 words**.

**Methods:** The methods will provide a description of how the study was carried out using usual conventions for describing a study and correct terminology. Usually the methods section is written in a standardized way and contains detail on the following:

- participants used in the study
- the general protocol
- the specific measurement details
- the analysis of the data

This section should be **NO MORE than 300 words**.

**Results:** The results section should include:

- a description of the participant characteristics
- tables and figures of the results where necessary
- a description of the main findings

This is usually the shortest section and is **generally around 200 words**.

**Discussion:** The discussion explains the results to the reader. The explanation should make reference to the information provided in the introduction, particularly the aim of the investigation. Any interpretation of the results should refer to the findings of previous investigations in the area. This section should finish with a concluding statement which relates to the main findings of the study. Were the main aims of the study realized and if so what were the main implications of these findings?

This section should be **NO MORE than 500 words**.

### References:

There are two components to a referencing system:

- inclusion of reference citations in the main text of the report
- production of a list of references at the end of the report

In the physical activity sciences there are a number of referencing styles adopted by the academic journals. We will follow a commonly used style in the biological/medical journals in which the citations within the text are given in the form of **author name(s) followed by the publication year**, e.g., McManus and Masters (2007). When there are more than two authors, the reference is given as McManus *et al.* (2007). There is a convention for style and format of the references in the list at the end of the report too. References in the references list are listed in **alphabetical order and are numbered**. When there are more than two authors use the same convention as above (*et al.*). Examples of the format for a journal, a book and a chapter in an edited book are given below:

- **Journal article:**  
Lanningham-Foster L *et al.* Energy expenditure of sedentary screen time compared with active screen time for children. *Pediatrics*. 2006; 118:1831-1835.
- **Book:**  
Kinder M. *Playing With Power in Movies, Television and Video Games: From Muppet Babies to Teenage Mutant Ninja Turtles*. Berkeley, CA: University of California Press; 2000.
- **Chapter in an edited book:**  
Vandewater EA, Cummings HM. Media Use and Childhood Obesity. In: Calvert SL, Wilson BJ, eds. *The Handbook of Children, Media and Development*. West Sussex, UK: Blackwell Publishing; 2008:355-380.