

School of Kinesiology
Faculty of Health Sciences
Western University

KIN 3337A
Physiology of Fitness Appraisal
Winter 2018

Instructor:	Glen Belfry PhD	Office:	Thames Hall Room 2148
Location:	Health Sci Bldg Rm 35	Office Hours:	by appointment
Lectures:	Mo 9:30AM-10:30AM We 8:30AM -10:30AM	Phone:	519-661-2111 x 88364
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Lab Coordinator: Michael Herbert MHK
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NOTE: All course information including grades, assignment outlines, deadlines, etc. are available via OWL. Check the website regularly for course announcements.

Calendar Course Description:

The scientific basis of physical fitness appraisal; the construction and the effective administration of physical fitness tests, including motor fitness, cardiovascular endurance fitness and body composition; individual fitness appraisal.

Introduction to CSEP-Health & Fitness Program's Health-Related Appraisal and Counseling Strategy Certification

Anti-requisite(s)/Pre-requisite(s)/Co-requisite(s) if applicable:

You are responsible for ensuring that you have successfully completed all course pre-requisites, and that you have not taken an anti-requisite course.

Unless you have either the requisites for this course or written special permission from the course department to enroll in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

Recommended Text: *CSEP-PATH* Manual

Course format:

Lectures - 9:30-10:30pm Monday and Wednesday Rm. HSB-35

Lab (2 Hours – TH 2108)

- Monday: 11:30
- Tuesday: 8:30am, 10:30am, or 12:30pm
- Thursday: 10:30am, or 12:30pm
- Friday: 10:30
- Labs begin week of September 11
- ***Appropriate exercise attire is required for labs***

Lab Topics

Pre-Screening (PAR-Q+, consent forms, etc.), Resting Heart Rate and Blood Pressure
CSEP Aerobic Fitness tests
ECG
Body Composition
Musculoskeletal Fitness (CSEP)
Musculoskeletal and 1 RM testing (Non-CSEP)

**** NO labs** October 9-13

Evaluation:

1. Mid-term: Thursday, November 2: 5:30pm (20%)
2. Lab exam: Thursday, November 30: 5:30pm (20%)
3. Practical Exam (15%)
4. Lab assignments (5) (10%)
5. Lab tutorials (5) (5%)
6. Final exam: TBA during December exam period. (30%)

Lecture outline:

Physiology of Fitness Appraisal Chapter 1

I. A. Measuring Gas Exchange to Evaluate Cardiovascular Function and Cellular Respiration.

Maximal Oxygen Consumption (VO_2 Max)

B. Coupling

Steady State: $VO_2 = CO_2$

C. Physical Activity is the Major Challenge to Homeostasis of the Cellular Environment.

D. Patterns of Change in O_2 uptake and CO_2 Output (external respiration) as related to function and fitness.

II. Physiology related to Test protocols that measure Maximum Oxygen Consumption (VO_2 max tests).

(As opposed to predictive tests for VO_2 max)

A.

1. Fatigue
2. Dyspnea
3. Pain

B. (Continued) Physiology related to Test protocols that measure Maximum Oxygen Consumption (VO₂ max tests).

1. Substrate Utilization
2. O₂ cost of work
3. Lactate Increase and Anaerobic Threshold
4. Kinetics

- III. A. Dysfunction of the Cardio Respiratory Systems
Blood Pressure and Hypertension

B. Dysfunction of the Cardio Respiratory Systems

1. Heart/ CV Disease

C. Ventilatory Disorders

- IV. **Testing for Cardiorespiratory Fitness**

Pre test control

A. Criteria for a good test of CV fitness.

**B. Criteria for stopping a test.
Symptoms**

C. Criteria for stopping a test: Blood Pressure

D. Criteria for stopping a test: HR response

E. Submaximal Lab Tests

F. Maximal Tests

Purposes

G. Testing Protocols and their effect on Aerobic Function

H. Field and Performance tests for determining VO₂ max

I. VO₂ max

- V. The interplay between Science and the Application of the Science.

Notes

Components of maximal testing

**Detaching your brain.
Emotional incapacitation**

Article

Monitoring high intensity endurance exercise with heart rate and thresholds

Marcel R Boulay, JA Simoneau, Gilles Lortie, Claude Bouchard
Med Sci Spt Ex. Vol 29, No1, 125-132

Chapter 2 ECG/EKG

- I. **History**
 - II. **Rhythmic Excitation of the Heart**
 - 1. *The heart as excitable tissue.*
 - 2. *Action Potentials*
- Figure: 1. Evolution of PQRST.
- 2. Limb leads.
 - 3. Augmented limb leads.
 - 4. Precordial leads.

- III. **EKG Interpretation**
 - 1. Rate
 - 2. Rhythm
 - 3. Axis
 - 4. Hypertrophy
 - 5. Infarction

- 1. **Rate**
 - a. Ectopic Foci.
 - b. Rate :
 - c. Atrial Fibrillation
- 2. **Axis:**
- 3. **Infarction:**
- 4. **Blocks:**
- 5. **Rhythm:**

Chapter 3

- I. **Body Composition: Energy Expenditure**
 - A. Metabolism: RQ
 - B. Body Composition:**
 - 1. Behnke Classification Schema
 - 2. Summary of Behnke Model
 - 3. Brozek/Siri Model
 - 4. Chemical Model
 - 5. Anatomical Model
 - C. Special Considerations: Estimation of Basal Metabolic Rate**
- II. **Ideal Body Composition**
- III. **Prevalence of Body Weight**

IV. Methods of Assessing Body Composition

1. BMI
2. Waist to Hip Circumference Ratio (WHR)
3. Body Types
4. Height-Weight Tables
5. Skinfold measurements

b. Sources of Error

1. Caliper selection:
2. Tester reliability:.
3. Constant Compressibility
4. Skin thickness;
5. Constant fat fraction:

c. Prediction Equations

6. Hydrostatic Weighing

- a. Assumptions
- b. Densitometry and Hydrostatic Weighing Techniques

7. Bioelectric Impedance

Article

Effects of training duration on substrate turnover and oxidation during exercise

S.M. Philips, H.J. Green, M.A. Tarnopolsky,
G.J. Heigenhauser, R.E. Hill and S.M. Grant
J. Appl. Physiol. 81(5):2182-2191

Chapter 4 Physiological Testing

I. Skeletal Muscle: Fibre Type, Glycogen and Metabolic Capacity

1. Percutaneous biopsy technique:
2. Technique
3. Fibre typing: Recognition of Fibre type
4. Stains
NADH tetrazolium reductase
Periodic-acid Schiff stain

5. Assays: Manufacturing Metabolism

Blood/Muscle Lactate:

PFK

HK

SDH + CS

Above information used for indication of Skeletal Muscle and Function:

Chapter 5
CSEP-PATH Certification

- I. Determinants of Health**
- II. Role of Appraiser**
- III. Health Benefits**
- IV. Changing your lifestyle**
 - A. Understanding Behaviour Change
 - B. Structure of Self Esteem
 - C. SE affects Behaviours:
 - D. Factors inherent in SE:
 - E. Self Esteem effected by perceptions:
 - F. Self esteem is Learned
 - Unconditional Acceptance
 - Conditional Acceptance
 - Bottom Line Concept:
- V. Factors Affecting Participation in Physical Activity (change/growth)**
 - A. Reasons for activity:
 - B. Beliefs:
 - C. Attitudes:
 - D. Intentions:
- VI. Process or Stages of Change**
- VII. Counseling**
 - Issues requiring referral to experts
- VIII. Goals:**
- IX. CSEP – History – Advise – Relapse – Case Studies**

Course/University Policies

1. **Lateness/Absences:** Assignments are due at the beginning of class on the assigned due date and will not be accepted late, except under medical or other compassionate circumstances. Electronic submission of assignments will not be accepted (unless otherwise specified) under any circumstances. Submitting a late assignment without appropriate documentation will result in a zero (0) grade. Appropriate documentation for assignments worth less than 10% should be submitted to the instructor. A missed mid-term examination without appropriate documentation will result in a zero (0) grade. The course policy is not to allow make-ups for scheduled midterms, presentations or final exams, nor to assign a grade of Incomplete without acceptable and verifiable medical (or equivalent compassionate) reasons. Acceptable reasons might include hospital stays, serious illness, family emergencies (like serious accidents or illness, death) or similar circumstances.

2. **Written documentation:** Students who require academic accommodation should provide notification and documentation in advance of due dates, examinations, etc. stating specific reasons and dates. Students must follow up with their professors and their Academic Counselling office in a timely manner. Documentation for any request for accommodation shall be submitted directly, as soon as possible, to the Kinesiology Undergraduate Office **not** to the instructor, with a request for relief specifying the nature of the accommodation being requested. This documentation should be obtained at the time of the initial consultation with the physician or walk-in clinic. An "Accommodation Consideration Request Form" found online or in the Kinesiology Undergraduate Office" for **ALL** such accommodation requests must be submitted into the Kinesiology Undergraduate office. These documents will be retained in the student's file, and will be held in confidence in accordance with the University's Official Student Record Information Privacy Policy.

See <https://studentservices.uwo.ca/secure/index.cfm> for specific policy and forms relating to accommodation.

3. **Grades:** Where possible assignment objectives and rubrics will be posted on OWL. Should you have a concern regarding the grade you received for an assignment or feel that it is unfair in any way, you must wait 24 hours from the receipt of the assignment to approach the instructor or TA. In doing so, please make an appointment and prepare in writing, with evidence, why you feel your grade is inappropriate. Please be aware that in requesting a grade reassessment, your grade could go up/down/or stay the same. Note that calculations errors (which do occur!) should be brought to my attention immediately.

15% of course grades will be posted by the last day to drop a course.

4. **Scholastic offences:** They are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site:

http://www.uwo.ca/univsec/handbook/appeals/scholastic_discipline_undergrad.pdf.

A) Students must write their essays and assignments in their own words. Whenever students take an idea, or a passage from another author, they must acknowledge their debt both by using quotation marks where appropriate and by proper referencing such as footnotes or citations. Plagiarism is a major academic offence (see Scholastic Offence Policy in the Western Academic Calendar). All required papers may be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between Western University and Turnitin.com (<http://www.turnitin.com>)

B) Computer marked multiple-choice tests and/or exams may be subject to submission for

similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating.

5. **Formatting** (as recommended by the course instructor): example- APA style is the approved style of writing for all assignments produced for this course. Please refer to Western University Library webpage for information on citation style and format or consult the APA publication manual: Publication manual of the American Psychological Association (6th ed.). (2009). Washington, DC: American Psychological Association.

6. According to the **Examination Conflict policy**, “A student who is scheduled to write more than two examinations in any 24-hour period may request alternative arrangements through the office of their Academic Counsellor.” **This policy does NOT apply to mid-term examinations.* There will be no make-up for the mid-term exam. Students who miss this exam with a valid reason will have the final re-weighted accordingly.

7. **Classroom Behaviour**: Class will begin promptly at the time specified at the top of page one of this syllabus. In the event that you must arrive late, please enter the classroom with a minimal disturbance to the class. I reserve the right to lock the classroom door and deny entrance if lateness becomes a common occurrence. Excessive talking during class time is disruptive, disrespectful, and will not be tolerated. Students engaging in such behaviour may be asked to leave the room. Cellular phones, pagers, and text-messaging devices are disruptive when they ring in class. If you must bring these with you, please place them on silent mode or turn them off during class. Failure to do so may result in your being asked to leave.

8. Laptops for the **purpose of typing lecture notes** are permitted in class, but please be respectful to your fellow students and turn the sound off. If I receive complaints from other students regarding noise or other disruptive behaviour (e.g., watching videos on YouTube.com, updating your Facebook status, playing Solitaire), your classroom laptop privileges will be revoked.

9. Audio and/or videotaping of lectures is not permitted unless approval has been sought from the instructor in advance.

STUDENT CODE OF CONDUCT

The purpose of the Code of Student Conduct is to define the general standard of conduct expected of students registered at Western University, provide examples of behaviour that constitutes a breach of this standard of conduct, provide examples of sanctions that may be imposed, and set out the disciplinary procedures that the University will follow. For more information, visit

<http://www.uwo.ca/univsec/board/code.pdf>

ENGLISH PROFICIENCY FOR THE ASSIGNMENT OF GRADES

Visit the website <http://www.uwo.ca/univsec/handbook/exam/english.pdf>

SUPPORT SERVICES

There are various support services around campus and these include, but are not limited to:

1. Student Development Centre -- <http://www.sdc.uwo.ca/ssd/>
2. Student Health -- <http://www.shs.uwo.ca/student/studenthealthservices.html>
3. Registrar's Office -- <http://www.registrar.uwo.ca/>
4. Ombuds Office -- <http://www.uwo.ca/ombuds/>

Students who are in emotional/mental distress should refer to Mental Health@Western <http://www.uwo.ca/uwocom/mentalhealth/> for a complete list of options about how to obtain help.”