

# McMASTER UNIVERSITY

## *Department of Kinesiology*

### KINESIOLOGY 3U03 - EVENING

#### HUMAN GROWTH AND DEVELOPMENT: GENETIC AND NEURO-ENDOCRINE REGULATION OF SOMATIC GROWTH, MUSCLE, PHYSICAL ACTIVITY, AND PERFORMANCE

Winer Term, 2018

Office location and hours T.B.A. (or by appointment)

Lectures: Thursday 7:00 to 10:00 pm

Randy Calvert

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ABB102

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#### **COURSE DESCRIPTION**

This course is oriented for students in 3rd or 4th year Kinesiology and focuses on the physical growth and functional (physiological) development from the prenatal period through childhood into adulthood and the predominant genetic / endocrine / nutritional factors modulating development and physical performance. The course is highly physiologically and biologically based. A background in Human Physiology and Anatomy and Kinesiology 2FO3 (Human Growth, Maturation and Development) are pre-requisites. The course will focus on integrated genetic and endocrine regulation of pre- and post-natal growth and development, morphological (size and shape) and functional (exercise capacity and health effects) development from conception to adulthood.

#### **OBJECTIVES**

1. to introduce genetic and endocrine regulation of pre- and post-natal somatic growth, maturation and development and to discuss their roles in relation to human variation in exercise performance and health during childhood
2. to examine growth, gender and maturity-related differences and changes in morphological (size and shape) and functional (exercise capacity and health) development
3. to examine nutritional requirements, physical activity and energy expenditure and their impact on growth, maturation, and performance.

#### **REQUIRED READINGS / TEXT**

##### **Course Lecture Notes:**

The instructor will post all slides presented in class lectures on Avenue To Learn in Power Point and PDF formats. Information on these slides may only be partially complete and students are expected to attend class and incorporate supplemental information discussed by the instructor to the summary comments on the slides.

**Electronic lecture materials be available at the beginning of the term and as developed!**

**SUGGESTED READINGS / COURSE TEXT:**

The text, **Growth, Maturation and Physical Activity** will be used as the main reference source for this course. While students do not necessarily have to purchase their own copy of this text, information from this source will help to expand upon and perhaps clarify content and concepts covered in lectures..

Growth, Maturation and Physical Activity, R.M. Malina, C. Bouchard and O. Bar-Or, Second Edition, Human Kinetics Publishers Inc.; Champaign, Il., 2004.

**TOPICS TO BE COVERED:**

The instructor will **attempt** to cover the following sections and topics, but not necessarily in the order presented below and not necessarily in formal lectures. Some topics may be covered less formally as assigned readings depending on circumstances and the needs of the class. Reading assignments will be noted at the beginning of each new section.

**Course Overview**

1. Prenatal Growth and Functional Development (Chapter 2)
  - Prenatal growth and factors affecting birth weight
  - Congenital malformations and fetal motor activity
2. Skeletal Muscle Tissue (Chapter 7)
  - Muscle fibre types, size, and metabolic / contractile properties
3. Genetic Regulation of Growth, Maturation, and Performance (Chapter 18)
  - Genetic influence on fetal development, growth, maturation, and performance
4. Hormonal Regulation of Growth and Maturation (Chapter 19)
  - Endocrine, growth, and other hormones
5. Energy and Nutritional Requirements (Chapter 20)
  - Energy requirements to support growth
6. Physical Activity and Energy Expenditure (Chapter 21)
  - Assessment of energy expenditure, patterns of physical activity during growth
7. Physical Activity as a factor in Growth, Maturation, and Performance (Chapter 22)
  - Activity and various tissues, fitness and performance, and trainability
8. Undernutrition in Childhood and Adolescence (Chapter 23)
  - Forms of undernutrition and consequences during growth
9. Other Factors Affecting Growth, Maturation, and Performance (Chapter 25)
  - Social, ethnic, and climate variation in growth and maturation
10. The Young Athlete (Chapter 28)
  - Characteristics of the young athlete and the influence of training on growth and maturation

**COURSE FORMAT:**

The course will consist of 1 formal 3 hour lecture per week for the duration of the term.

**STUDENT RESPONSIBILITIES:**

1. Attendance at lectures.
2. Completion of in-class test(s) (date(s) and format to be discussed)
3. Completion of the final exam during regular Winter Term examination period.

**EVALUATION**

Midterm Exam (in class)	30%
In-class Quizzes	25%
Final exam	<u>45%</u>
	100%

*"All instructors for all undergraduate courses, except supervised study, thesis and research/study courses, be required to return grade material equal to a minimum of 10% of the session's total mark prior to the final date which a student may withdraw from a course without academic penalty."*

*This date is not the "drop and add" date but Friday March 16, 2018 for this Winter term courses (the last day for canceling courses without failure by default), students must be given back work equal to 10% of the grade.*

**IMPORTANT NOTES:****ACADEMIC ACCOMMODATION OF STUDENTS WITH DISABILITIES**

Students who require academic accommodation must contact Student Accessibility Services (SAS) to make arrangements with a Program Coordinator. Academic accommodations must be arranged for each term of study. Student Accessibility Services can be contacted by phone (905) 525-9140 ext. 28652 or email [sas@mcmaster.ca](mailto:sas@mcmaster.ca). For further information, consult McMaster University's Policy of Academic Accommodation of Students with Disabilities. <http://www.mcmaster.ca/policy/Students-AcademicStudies/AcademicAccommodation-StudentsWithDisabilities.pdf>

**ON-LINE LEARNING RESOURCES**

In this course, we will be using A Venue to Learn. Lecture notes, class schedule, and other notices may be posted electronically. Students should be aware that, when they access the electronic components of this course, private information such as first and last names, user names for the McMaster e-mail accounts, and program affiliation may become apparent to all other students in the same course. The available information is dependent on the technology used. Continuation in this course will be deemed consent to this disclosure. If you have any questions or concerns about such disclosure please discuss this with the course instructor.

**USE OF COURSE MATERIALS**

Course materials provided by the instructor are for use by students registered in this class only. Under no circumstances are these materials to be shared, posted or sold to a third party without permission from the instructor. This includes, but is not limited to, online posting of instructor provided lecture/lab notes, online lectures, recordings of lectures, or any lab materials on a website other than the Avenue site designed for the course.

**ABSENCE FROM CLASS**

In the event of an absence for medical or other reasons, students should review and follow the Academic Regulation in the Undergraduate Calendar "Requests for Relief for Missed Academic Term Work".

**POLICY REGARDING DEFERRED TESTS AND EXAMS**

Students who miss the term test or final exam for legitimate reasons such as illness may be allowed to write a deferred or "make-up" test. In all instances, appropriate documentation must be submitted to the Office of the Associate Dean, Faculty of Science.

Students who miss a Registrar-scheduled final exam can apply to the Associate Dean's office for permission to write in the deferred final exam schedule. In all cases, appropriate documentation must be submitted to the Office of the Associate Dean, Faculty of Science, for consideration of deferred examination permission. Under no circumstances will the instructor re-schedule a final exam for individual students.

**MODIFICATIONS TO THE COURSE:**

The instructor and university reserve the right to modify elements of the course during the term. The university may change the dates and deadlines for any or all courses in extreme circumstances. If either type of modification becomes necessary, reasonable notice and communication with the students will be given with explanation and the opportunity to comment on changes. It is the responsibility of the student to check their McMaster email and course websites weekly during the term and to note any changes.