

 <b>FLORIDA ATLANTIC UNIVERSITY</b>	<b>COURSE CHANGE REQUEST</b> <b>Graduate Programs</b>	UGPC Approval _____ UFS Approval _____ SCNS Submittal _____ Confirmed _____ Banner Posted _____ Catalog _____
	Department Exercise Science & Health Promotion College Education	
<b>Current Course Prefix and Number</b> PET 5077	<b>Current Course Title</b> Aging, Decision Making & Mobility	
<i>Syllabus must be attached for ANY changes to current course details. See <u>Guidelines</u>. Please consult and list departments that may be affected by the changes; attach documentation.</i>		
<b>Change title to:</b> Seminar in Exercise and Aging  <b>Change prefix</b> From:                      To:  <b>Change course number</b> From:                      To:  <b>Change credits*</b> From:                      To:  <b>Change grading</b> From:                      To:  <small>*Review Provost Memorandum</small>	<b>Change description to:</b> A team taught course highlighting the results of clinical exercise trials targeting the age-related loss in neuroprotective mechanisms and skeletal muscle function.  <b>Change prerequisites/minimum grades to:</b>  <b>Change corequisites to:</b>  <b>Change registration controls to:</b>  Please list existing and new pre/corequisites, specify AND or OR and include minimum passing grade.	
<b>Effective Date</b> <small>(TERM &amp; YEAR)</small>	<b>Terminate course</b> <b>List final active term</b>	
<b>Faculty Contact/Email/Phone</b>		
<b>Approved by</b> Department Chair <u>Michael White</u> College Curriculum Chair <u>Pat R. King</u> College Dean <u>Valerie J. Pruster</u> UGPC Chair _____ UGC Chair _____ Graduate College Dean _____ UFS President _____ Provost _____	<b>Date</b> 1/25/18 2/7/18 2/10/18 _____ _____ _____ _____	

Email this form and syllabus to [UGPC@fau.edu](mailto:UGPC@fau.edu) one week before the UGPC meeting.

**GRADUATE COLLEGE**

**FEB 14 2018**

Received

**Aging, Decision Making & Mobility PET 5077 (3 credits)**

Fall 2017; CRN: 117745; Room AL 342 Monday 6:30-9:20

Dept. of Exercise Science and Health Promotion

College of Education, Boca Campus

Florida Atlantic University

Instructors: Michael Whitehurst, EdD, FACSM  
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MW 10:30-1:30

Course Description: An inquiry into age related decline in decision-making, muscle and mobility with particular emphasis on the role of exercise in attenuating that decline.

Prerequisite: PET 4351 or permission of the instructor.

Textbook: No text. See <http://Canvas.fau.edu> for ALL relevant course material.

Evaluation: Exams\* 3 @ 40 points each 120 points  
Laboratory Write-ups 4 @ 10 points ea. 40 points  
Seminar papers 3 @ 10 points ea. 30 points

\* Exams will be delivered online during specified day and time.

Grading Scale (%):

A=100-95, A-=94-91, B+=90-87, B=86-82, B-=81-78, C+=77-74, C=73-70, C-=69-67, D+=66-64, D=63-61, D-60 58, F=<58

Code of Academic Integrity:

Students at Florida Atlantic University are expected to maintain the highest ethical standards. Dishonesty is considered a serious breach of these ethical standards, because it interferes with the University mission to provide a high quality education in which no student enjoys an unfair advantage over any other. Dishonesty is also destructive of the University community, which is grounded in a system of mutual trust and places high value on personal integrity and individual responsibility. For more information, see

[http://wise.fau.edu/regulations/chapter4/4.001\\_Code\\_of\\_Academic\\_Integrity.pdf](http://wise.fau.edu/regulations/chapter4/4.001_Code_of_Academic_Integrity.pdf)

Student Code of Conduct

Florida Atlantic University is a public research university with multiple campuses along the southeast Florida coast serving a uniquely diverse community. It promotes academic and personal development, discovery and lifelong learning. FAU fulfills its mission through excellence and innovation in teaching, outstanding research and creative activities, public engagement and distinctive scientific and cultural alliances, all within an environment that fosters inclusiveness. FAU accomplishes its mission primarily through its students, teachers and researchers, its undergraduate educational programs, its graduate and professional offerings, and its linkages to other educational institutions and in the community. For more information, see

[http://www.fau.edu/regulations/chapter4/REGULATION%204%20007\\_6%2023%2015%20Clean%20Copy%20rev%2012.16.pdf](http://www.fau.edu/regulations/chapter4/REGULATION%204%20007_6%2023%2015%20Clean%20Copy%20rev%2012.16.pdf)

Disabilities

In compliance with the Americans with Disabilities Act (ADA), students who require special accommodations due to a disability to properly execute coursework must register with the Office for Students with Disabilities (OSD) located in Boca Raton - SU 133 (561-297-3880), in Davie - MOD I (954-236-1222), in Jupiter - SR 117 (561-799-8585), or at the Treasure Coast - CO 128 (772-873-3305), and follow all OSD procedures.

General Guidelines: You are responsible for all readings, the lecture notes/materials, labs, seminars and basically everything that is said in class. The study questions appearing at the front of each area of study (e.g. sarcopenia) serves as an outline for each lecture and highlights areas of interest and sort of maps out the upcoming labs, seminars and exams. (NOTE: find syllabus, lab demonstrations, PowerPoint lectures AND journal articles on <http://canvas.fau.edu>). Please study the assigned readings before each lecture. Ideally, there are no make-up examinations and you will not be allowed to take an exam early or late (unless you have premonitions foretelling horrific events necessitating advance planning).

Course Organization: You will note that the course contains three aging themes, with each theme spread out over several weeks with the first week of a theme spent in lecture, second week a laboratory demonstration, a third week for seminar and the final week of a theme used for testing your knowledge.

Seminar Paper: You will write a 1-2 page single spaced (10 font) paper for each seminar topic (e.g. sarcopenia). **YOU MUST BEGIN EACH SEMINAR PAPER WITH A QUESTION** with all subsequent information provided in an attempt to answer your question. When writing your paper, cite at least three references (2008 or later) numerically (e.g. older adults who are chronic exercisers present significantly more cortical mass than their non-exercising cohorts<sup>1-3</sup>). List references at the end of your paper in the order they appear in the body of the paper (you may need to decrease the font size). Failure to adhere to the required format or to begin your paper with a question and/or poorly framed answers will result in deductions. You should expect to discuss your paper during the seminar as well as any assigned readings. **Bring your paper to the seminar. Finally, regarding the seminar (discussion):**

- Be able to identify the research questions/hypotheses for each of the articles you cite in your paper
- Be conversant with subject characteristics and methods employed in the studies as well as the results and conclusions from the papers you cite

Laboratory Write-ups: You will be expected to write a 1-2 page report including a purpose statement, results (i.e. present data in tabular and chart form) and conclusion (answer several questions with references listed per the above - see seminar paper).

PowerPoint files and Required Reading (see canvas under *file for all PowerPoint files and required readings*)

You will note that the PowerPoint files and Reading list found in canvas are numbered and appear in the syllabus in chronological order.

**Aug. 21** (Course Overview, Introductory lecture see PowerPoint: Intro Lecture..... Michael Whitehurst, EdD

Review syllabus, course format, the laboratory demonstrations, how to prepare for seminars (including writing of papers required for seminar), exam format and study questions.

- What is aging?
- Evolution, the environment and a genome based on movement
- Overview of the three areas of study, including lifestyle choices and cog function across lifespan, sarcopenia and neurotrophin expression
- Primary & secondary contribution to aging
- Population dynamics in an aging America & financial implications
- Aging Research Methodology
- Brief introduction to neurophysiology of aging neurons (Segway into Dr. Zoeller's lecture dealing with lifestyle choices and cognitive function across the lifespan)

**Aug. 28** Lifestyle choices and cognitive function across the lifespan PowerPoint #1, Required Readings 1-2... Robert Zoeller, PhD

- What is cognitive function?
- Defining & measuring cognitive function
- Influence of physical activity on cognitive function across the lifespan
- Types of studies: cross-sectional, longitudinal, interventional
- Types of physical activity and their effect on cognitive function
- Exercise mechanisms associated with improved or preserved cognitive function

**Sept 11** Laboratory Demonstration: *Observing/Evaluating Dementia* using the Montreal Cognitive Assessment and the Mini Mental State Examination (MMSE) No Class, data collection on your own (see instructions).

**Sept 18** Seminar: Prevalence, causes and exercise as treatment for dementia.....Robert Zoeller, PhD

Sept 25 Exam 1 (4 short answer/essay type questions generated during seminar and taken online, available entire day with 3 hour window once you begin)

- Oct 2 Lecture on Sarcopenia and Mitochondrial Free-Radical Theory of Aging PowerPoint #2, Readings 3-4.....Andrew Khamoui, PhD
- What is sarcopenia?
  - What factors increase the risk of sarcopenia (e.g. reduced protein consumption/absorption/synthesis, low IGF-1, low GH, low testosterone, UPP, inflammatory response, sedentary lifestyle)
  - How is muscle changed structurally (e.g. alignment of contractile proteins) and functionally (i.e. force, torque) as a result of sarcopenia?
  - Is sarcopenia more prevalent in a specific muscle fiber type? If so, why and what effect does a decrease in a particular fiber type have on maintaining functional mobility?
  - Considering the **morphology of the neuromuscular junction** including the transmission of the AP through the junction (i.e. synaptic transmission) and the molecular basis for contraction – how are these structures affected by age?
  - Is a change in cytosolic AMPK concentrations associated with sarcopenia
  - Discuss akt/mTORC (i.e. mammalian target of rapamycin complex) as the premier activating mechanism triggering muscle hypertrophy
  - What effect does sarcopenia have on our nation’s health care costs and why?
  - Discuss in detail several “major” exercise intervention studies that have illustrated the efficacy of resistance exercise in combating sarcopenia
  - Role of mitochondria in longevity and healthspan
    - Reactive oxygen species and oxidative stress
    - Mitochondrial free-radical theory of aging
    - Evidence supporting and refuting the role of mitochondrial oxidative stress in aging and age-related disease

Oct 9 Laboratory Demonstration: Evaluating mitochondrial respiration in situ in permeabilized skeletal muscle fibers .....Andrew Khamoui, PhD

Oct 16 Seminar: Role of mitochondria in skeletal muscle aging.....Andrew Khamoui, PhD

Oct 23 Exam 2 (4 short answer/essay type questions generated during seminar, exam taken online – available entire day with 3 hour window once you begin)

- Oct 30 Lecture: Exercise: a stressor that induces BDNF expression: A pathway to brain health, PowerPoint #3, Required Readings 5-6.....Michael Whitehurst, EdD
- Brain derived neurotrophic factor (BDNF) ????
  - BDNF function (neuron survival, differentiation, plasticity)
  - BDNF expressed in an activity dependent manner as part of an adaptive stress response
    - BDNF synthesis
    - Synaptic signaling (glutamate, AMPA and NMDA receptors – memory and learning)
    - BDNF signaling and target receptors (TrkB, p75)
  - Age related changes in BDNF expression and the relationship to neurodegenerative disease
  - Inducing BDNF Expression: Exercise, caloric energy restriction, intellectual stimulation
    - Animal models, Human studies

Nov 6 Laboratory Demonstration: Comparative study of mouse and human hippocampi.....Michael Whitehurst, EdD

Nov 13 Seminar: The upregulation of BDNF through exercise, what kind, how much and how hard?.....Michael Whitehurst, EdD

Nov 20 Exam 3 (4 short answer/essay type questions generated during seminar, exam taken online - available entire day with 3 hour window once you begin)

Nov 27 Final Exam (you will select ONE question from among three that address the topics (lifestyle choices and cognitive function across the lifespan, sarcopenia, BDNF) explored in this course. The expectation is that you will provide a detailed response demonstrating your depth of knowledge in the area of your choice. Importantly, begin your thesis with a question.