University of Nevada, Las Vegas  
Department of Kinesiology and Nutrition Sciences  
KIN 457/657: Physiology of Endurance Performance  
Fall 2014

Instructor
John A. Mercer, Ph.D.  
BHS 540 895-4672  
Office hours:  M, Th 1-3 PM, or by appointment

Course Content:
The primary objective of this course is to provide a study of endurance performance from an exercise physiology perspective. At the conclusion of the course, the student will be able to demonstrate an understanding of physiological factors that influence endurance swimming, biking, and running performance, for example.

Textbook
Required
• Tim Noakes “Lore of Running”, Human Kinetics.

Recommended:
• Taber’s Medical Dictionary  
• Any Exercise Physiology textbook

Grading Elements

25% Midterm: Tentative date: 10/17

30% Final Exam: Tentative date: 12/12  
The final exam will cover all course material.

35% Presentations (see description)  
10% reduction in grade per day late.

10% Get Involved  
An important part of education is being involved with research as well as connecting with the community. To earn this portion of your grade, you can volunteer to be a research subject, volunteer at some fitness event, or write a summary of three research papers.

0% Readings: You should be reading a research paper every day.

KIN 657: Additional exam questions, additional presentation duties
Important

**Academic Misconduct** – Academic integrity is a legitimate concern for every member of the campus community; all share in upholding the fundamental values of honesty, trust, respect, fairness, responsibility and professionalism. By choosing to join the UNLV community, students accept the expectations of the Academic Misconduct Policy and are encouraged when faced with choices to always take the ethical path. Students enrolling in UNLV assume the obligation to conduct themselves in a manner compatible with UNLV’s function as an educational institution.

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UNLV complies with the provisions set forth in Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990, offering reasonable accommodations to qualified students with documented disabilities. If you have a documented disability that may require accommodations, you will need to contact the DRC for the coordination of services. The DRC is located in the Student Services Complex (SSC), Room 137, and the contact numbers are: Voice (702) 895-0866, TTY (702) 895-0652, fax (702) 895-0651. For additional information, please visit: [http://studentlife.unlv.edu/disability/](http://studentlife.unlv.edu/disability/).
Presentations
Each student will give an individual presentation and be part of a group presentation during the semester.

Individual Presentation
Your presentation will consist of a review of a research article directly related to the group project. All research articles must be from peer-reviewed journals and represent empirical research (no literature reviews). A pdf of the paper must be sent to me (see class schedule) so that it can be posted for other students to read. The presentation is targeting your peers and will be given in person.

Your presentation will be 5-mins and will follow a specific timing format such that your presentation will have 20 slides set to show for 15 seconds per slide.

Group Presentation
Each group will consist of four members and the members must agree on a specific topic (see list). All members must participate in creating the video. Your presentation grade will be partly determined by group evaluation. The group will select a topic (see list) and provide a video targeted for the lay-audience. The video must include a bibliography (or citations embedded within the video presentation).

The group presentations must be 3-5 minutes in length and will be done via video. You are responsible for videotaping and uploading the video to Youtube or sending the movie file to me via email. If you use Youtube, you can set the video settings to ‘private’ and send the video link to me via Youtube. The class will view all videos.

All presentations must clearly distinguish between information that is based upon empirical vs. anecdotal evidence.

Your presentation grade will be determined through a combination of your individual and group presentations. Every presentation will be evaluated on points such as:

- Accuracy of information
- Use of empirical information
- Clarity
- Use of time
- Presentation quality
- Bibliography
Tentative Schedule – Subject to change

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topic</th>
<th>Chapter</th>
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| 1    | 8/29  | Introduction presentation  
                  Syllabus  
                  Critical Review of Literature  
                  Paper assignment (reading)  
                  Video presentation tips  
                  Research  
                  Pre-test |         |
| 2    | 9/5   | Muscle structure and function | 1       |
| 3    | 9/12  | Oxygen transport and running economy | 2       |
| 4    | 9/19  | Energy systems and running performance | 3       |
| 5    | 9/26  | Energy systems and running performance | 3       |
| 6    | 10/3  | Temperature regulation during exercise | 4       |
| 7    | 10/10 | Mid-term |         |
| 8    | 10/17 | SWACSM |         |
| 9    | 10/24 | Video Presentations |         |
| 10   | 10/31 | Nevada Day – No Class |         |
| 11   | 11/7  | Video Presentations |         |
| 12   | 11/14 | Out of Class assignment |         |
| 13   | 11/21 | Group Presentations (4) |         |
| 14   | 11/28 | Thanksgiving – No Class |         |
| 15   | 12/5  | Study Week | 1-4     |
| 16   | 12/12 | Final Exam |         |
1. Lactate Threshold, anaerobic threshold, OBLA
2. Why do I need to know LT, AT, and/or OBLA?
3. VO$_{2\text{max}}$ – How do you measure this?
4. VO$_{2\text{max}}$ – Why do I need to know this?
5. HR – why do I monitor this during exercise?
6. Running Economy – What is it and what influences it?
7. Muscle contraction performance: Force-Velocity
8. Muscle contraction performance: Length-Tension
9. Mechanism(s) of fatigue
10. Central Governor Model
11. Hydration strategies during endurance events
12. Thermoregulation – ways to stay cool during racing
13. Thermoregulation – ways to stay warm during racing
14. In-race nutrition strategies
15. Carbo-loading techniques
16. What to eat right after exercise?
17. Childhood obesity
18. Recommendations for kids competing in endurance events.
19. Training/racing recommendations for women who are pregnant
20. Marathon training programs
21. Ironman training programs
22. Ultramarathon training programs
23. Marathon in-race nutrition
24. Ironman in-race nutrition
25. Mechanism of overuse injuries
26. Rehabilitation of overuse injuries
27. Strength training for endurance events
28. Limitations to endurance performance
29. Running technique (e.g., Pose, Chi, …)
30. Pacing strategies (i.e., run-walk)
31. Relationship between SF and VO$_2$
32. Cross training
33. Performance enhancing drugs
34. Fiber typing of athletes
35. Changes in endurance performance with aging
36. Prediction models for endurance performance
37. Overtraining vs. overreaching
38. Lactate Shuttle
39. The athlete’s regular diet
40. Storage of fuel
41. Producing ATP aerobically
42. Biochemical events of muscle contraction
43. Interval training (or High Intensity Training)