PET5936: SCIENCE OF TRAINING HIGH PERFORMANCE ATHLETES: Part 1.
Developing physiological capacity

- **Instructor**: Dr. Christine Brooks
- **Email**: cmbrooks@ufl.edu
- **Phone**: 321-720-2705
- **Lecture Room**: Online
- **Office hours**: Via email or Skype

**COURSE DESCRIPTION**

This course overviews the theory and practice of sport training methodologies for enhancing the athlete’s physiological capacity. We begin by examining how to configure a sport-specific physical work capacity from the five foundational motor performance abilities of endurance, strength, speed, coordination and flexibility. The impact of growth, maturation and genetics is factored into the discussion. Other broad topics include:

- how the body adapts to a training stimulus
- principles of training theory
- development of sport specific strength, speed and endurance
- how the energy systems work and are fueled
- Overtraining and fatigue
- mechanics of the training plan.

The importance of a balanced approach to sport and life is emphasized throughout the course, with specific emphasis on the principle encompassed in the Hippocratic Oath of “doing no harm”.

**COURSE OBJECTIVES**

At the completion of this course students will be able to:

- demonstrate knowledge and understanding of important physiological and training theory principles as they apply to training athletes of any age to reach
their optimum athletic potential
• recognize how to develop fundamental and derive motor performance abilities of athletes generally, and in a specific sport (or positions within a team)
• locate and critically evaluate recommended performance evaluation practices for a specific sport and athletes
• understand the physiological theory of performance analysis tests that assess strength, power, energy system capacity and lactate test data
• review training programs and evaluate whether they are physiologically sound according to the specific needs of an athlete
• design a comprehensive annual training program for an athlete in a specific sport.

PREREQUISITE KNOWLEDGE

While this course is 'intermediate' in terms of coaching science training physical capacity theory, there are no prerequisites for this course. However, experience with sport, either as a coach and/or athlete, and desire to bring science into modern coaching practices is important.

TEXT MATERIALS AND E-LECTURES

All reading materials, study guides, video lecture modules and practice quizzes are packaged together. Reading resources are accessible via a link on the opening screen of each e-lecture module.

COURSE TOPICS:

• **Unit 1**: Physiological development through the athlete’s lifespan
• **Unit 2**: Energy systems and motor performance abilities
• **Unit 3**: Training science
• **Unit 4**: Sport specific strength and power
• **Unit 5**: Fatigue
• Unit 6: Overtraining
• Unit 7: Preparing the athlete for competition

GENERAL COURSE POLICIES

Attendance: This is an online course. There is no attendance requirement.

Assessments: All exams, quizzes, forums and assignments must be completed on time. A 5 point penalty will be assessed for a late assessment.

Technology: Contact the UF Computing Help Desk and e-Learning Support Services (www.helpdesk.ufl.edu/) if you have any technical issues with CANVAS, or your email.

Communication: Check announcements and course-related postings on CANVAS. This is how I will communicate with you throughout the semester.

Academic Honesty: As a UF student, you have committed to the following pledge: "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity." Please complete all work independently unless the instructor provides explicit permission for you to collaborate on course tasks. It is your responsibility to know and comply with all UF policies and procedures regarding academic integrity and the Honor Code. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see: http://www.dso.ufl.edu/SCCR/honorcodes/honorcode.php.

Course Examinations and Grading: Please ensure that the scores posted in CANVAS are accurate. Report discrepancies prior to the last day of classes. Grading will be based on the following assessments

• 7 Quizzes 30% of final grade.
• 7 Forums: 40% of final grade
• 1 Essay Assignment = 30% of final grade
<table>
<thead>
<tr>
<th>Letter grade</th>
<th>% of total points</th>
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<tbody>
<tr>
<td>A</td>
<td>95 - 100</td>
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<tr>
<td>A-</td>
<td>90 – 94.99</td>
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<tr>
<td>B+</td>
<td>87 – 89.99</td>
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<tr>
<td>B</td>
<td>80 – 86.99</td>
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<tr>
<td>C+</td>
<td>77 – 79.99</td>
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<td>C</td>
<td>70 – 76.99</td>
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<td>D+</td>
<td>67 – 69.99</td>
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<td>D</td>
<td>60 – 66.99</td>
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<td>E</td>
<td>&lt;60</td>
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**COURSE EVALUATION**

Students are expected to provide feedback on the quality of instruction in this course based on 10 criteria. These evaluations are conducted online at: [https://evaluations.ufl.edu](https://evaluations.ufl.edu).

Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at [https://evaluations.ufl.edu](https://evaluations.ufl.edu).

**COUNSELING AND MENTAL HEALTH SERVICES**

Phone number and contact for university counseling services and mental health services: 392-1575, or visit: [http://www.counseling.ufl.edu/cwc/Default.aspx](http://www.counseling.ufl.edu/cwc/Default.aspx)
# TEMPORARY COURSE SCHEDULE

( PLEASE FOLLOW THE COURSE SCHEDULE ON CAMPUS)

<table>
<thead>
<tr>
<th>Week # and date</th>
<th>Weekly assignments</th>
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</thead>
<tbody>
<tr>
<td><strong>Unit 1: Physiological development through the athlete’s lifespan</strong></td>
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</tbody>
</table>
| **Week 1** | 1. [Reading reference](#)  
2. Read Announcement 1.  
3. Review the following lessons  
4. **Complete Forum 1** |
| **Week 2** | 1. Reading reference  
2. Read Announcement 2.  
3. Review the following lessons  
4. Critical training periods  
5. Long term athlete development  
6. Factors affecting the athlete’s potential  
7. Body structures important for performance  
4. Complete [Unit 1 QUIZ](#) (PW is Quiz1)  
5. **Begin your research topic for Forum 2 (Due Sept 9th)** |
| **Unit 2: Energy systems and motor performance abilities** | |
| **Week 3** | 1. Reading reference  
2. Read Announcement 3.  
3. Review the following lessons  
4. POST your Forum 2 research assignment by Thurs so your colleagues have the time to respond to your work.  
8. The athlete’s energy supply  
9. Energy system, power and diet  
10. Aerobic capacity  
11. Strength |
| **Week 4** | 1. Reading reference  
2. Read Announcement 4.  
3. Review the following lessons  
12. Physiology of strength  
13. Anaerobic capacity |
14. **Coordination**
15. **Flexibility**

4. **Example on how to evaluate research.** This will, however, give you an idea about how you should approach your research topics for each forum.

5. Complete **Unit 2 Test**: PW is: **Quiz2**

6. Begin your research topic for **Forum 3 (Due Sept 23rd)**

### Unit 3: Training science

| Week 5 | 1. **Reading reference**
| 2. **Read Announcement 5.**
| 3. **Review the following lessons**
| 16. **Introduction to** the 2nd half of the course
| 17. **Biology of adaptation**
| 18. **Core training principles**

4. **POST** your Forum 3 research assignment by Thurs so your colleagues have the time to respond to your work.

| Week 6 | 1. **Reading reference**
| 2. **Read Announcement 6.**
| 3. **Review the following lessons**
| 19. **Training stimulus**
| 20. **Periodization theory**

4. Complete **Unit 3 test**: PW is **Quiz3**

5. Begin your research topic for **Forum 4 (Due Oct 7th)**

### Unit 4: Sport specific strength and power

| Week 7 | 1. **Reading reference**
| 2. **Read Announcement 7.**
| 3. **Review the following lessons**
| 21. **Strength and power basic concepts**
| 22. **Principle of specificity**

4. Post your Forum 4 research assignment by Thurs so your colleagues have the time to respond to your work.

| Week 8 | 1. **Reading reference**
| 2. **Read Announcement 8.**
| 3. **Review the following lessons**
| 23. **Peripheral strength adaptation**
| 24. **Central strength adaptations**
## Unit 5: Fatigue

### Week 9

1. **Reading reference**
2. **Read Announcement 9.**
3. **Review the following lessons**
   - 25. Fatigue theories
   - 26. Fatigue due to low fuel supplies
   - 27. Fatigue due to acidity
   - 28. Fatigue due to temperature
4. **Complete** the **Unit 4 test**: PW is: Quiz4

5. **Begin your research topic for Forum 5 (Due Oct 21st)**

### Unit 6: Overtraining

### Week 10

1. **Reading reference**
2. **Read Announcement 10.**
3. **Review the following lessons**
   - 29. Endocrine system basics
   - 30. Autonomic nervous system
   - 31. Fundamentals of overtraining
4. **Begin your research topic for** Forum 6 (Due Nov 4th)

### Week 11

1. **Reading reference**
2. **Read Announcement 11.**
3. **Review the following lessons**
   - 32. Heart rate and overtraining
   - 33. Monitoring overtraining
4. **Complete Unit 6 test**: PW is Quiz6

5. **POST** your Forum 6 research assignment by Thurs so your colleagues have the time to respond to your work.

## Unit 7: Preparing the athlete for competition

### Week 12

1. **Reading reference**
2. **Read Announcement 12.**
3. **Review the following lessons**
   - 34. Managing training effects
   - 35. Tapering and Training load quantification
   - 36. How to assemble the yearly plan
4. **Complete** the **Unit 7 test**: PW is Quiz7
<table>
<thead>
<tr>
<th>Unit 8: Consolidating your knowledge</th>
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<tr>
<td><strong>Week 13</strong></td>
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<tr>
<td>1. Reading reference - None</td>
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<tr>
<td>2. <a href="#">Read Announcement 13</a></td>
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<td>3. <em>Begin the Final Assignment</em></td>
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<td>4. Complete Forum 7</td>
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<tr>
<td><strong>Week 14/15</strong></td>
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<tr>
<td>1. Reading reference - None</td>
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<tr>
<td>2. <a href="#">Read Announcement 14</a></td>
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<tr>
<td>3. <em>Continue with the Final Assignment</em></td>
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<td>4. Post assignment by midnight Dec 5th</td>
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You have completed this course. Congratulations!