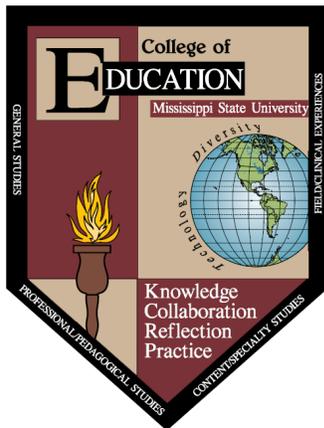


**MISSISSIPPI STATE UNIVERSITY  
COLLEGE OF EDUCATION**

**DEPARTMENT of KINESIOLOGY  
COURSE SYLLABUS**

<b>Course Prefix &amp; Number:</b>	EP 8253
<b>Course Title:</b>	Doping and Supplement Use in Sports
<b>Credit Hours:</b>	Three (3) semester hours
<b>Course Type:</b>	Lecture
<b>Catalog Description:</b>	Prerequisite: EP 3304 or equivalent, or consent of instructor. Examination of the pharmacological and nutritional agents used to enhance muscular development and exercise performance. Examination of commonly abused recreational drugs.

**College of Education Conceptual Framework:**



The faculty in the College of Education at Mississippi State University are committed to assuring the success of students and graduates by providing superior learning opportunities that are continually improved as society, schools, and technology change. The organizing theme for the conceptual framework for the College of Education at Mississippi State University is educational professionals - dedicated to continual improvement of all students' educational experiences. The beliefs that guide program development are as follows:

1. **KNOWLEDGE** - Educational professionals must have a deep understanding of the organizing concepts, processes, and attitudes that comprise their chosen disciplinary knowledge base, the pedagogical knowledge base, and the pedagogical content knowledge base. They must also know how to complement these knowledge bases with the appropriate use of technology.
2. **COLLABORATION** - Educational professionals must continually seek opportunities to work together, learn from one another, forge partnerships, and assume positions of responsibility.
3. **REFLECTION** - Educational professionals must be willing to assess their own strengths and weaknesses through reflection. They must also possess the skills, behaviors, and attitudes necessary to learn, change, and grow as life-long learners.
4. **PRACTICE** - Educational professionals must have a rich repertoire of research-based strategies for instruction, assessment, and the use of technologies. They must be able to focus that array of skills on promoting authentic learning by all students or clients, while exhibiting an appreciation and commitment to the value and role of diversity.

## **Course Objectives:**

1. Students will become familiar with the types of ergogenic practices, drugs and supplements used by athletes and fitness enthusiasts in order to enhance athletic performance, body composition and health. CFPO # 9
2. Demonstrate an understanding of the history of doping and supplementation in athletics. CFPO # 9
3. Demonstrate an understanding of optimal experimental design for studies examining the effectiveness of various drugs and supplements used by athletes. CFPO # 1, 8, 9
4. Demonstrate an understanding of the extent of doping and supplementation at various levels of competition and by various age groups. CFPO # 9, 12
5. Demonstrate an understanding of the mechanisms and possible mechanisms of action for the various drugs and supplements. CFPO # 1, 9
6. Become familiar with the scientific literature regarding various drugs and supplements used by athletes. CFPO # 8, 9
7. Demonstrate an understanding of the potential benefits and risks of various drugs and supplements. CFPO # 9, 12
8. Demonstrate an understanding of drug testing, including the methods used and the legal issues involved. CFPO # 4, 9, 12

## **Topics to Be Covered:**

1. Introduction (5 hours)
  - Definition of doping, supplementation and ergogenic aids
  - History of doping in sport
  - Determining the efficacy of performance-enhancing substances
    - Study design: placebo control, double-blind
    - Subjects and statistical power
    - Ethical issues
  - Extent of use of doping and supplementation
  - Drugs banned by major sporting organizations, including the International Olympic Committee (IOC) and United States Olympic Committee (USOC).
2. Anabolic/Androgenic Steroids and Prohormones (3 hours)
  - Natural and synthetic androgens
  - Tetrahydrogestrinone (THG)
  - Androstenedione, DHEA, and related compounds
  - Polypharmacy: Use of other drugs with anabolic/androgenic steroids
  - Human chorionic gonadotropin (hCG) and luteotrophic hormone
  - Tamoxifen
3.  $\beta$ 2-Agonists (3 hours)
  - Use as a bronchodilator to enhance exercise performance
  - Use to enhance muscle force and power production
  - Effects of longer-term use on body composition
4. Growth Hormone and Growth Hormone Releasers (3 hours)
  - Use of growth hormone as an ergogenic aid.
  - Arginine, ornithine, and lysine

5. Blood Doping and Recombinant Erythropoietin (rEPO) (3 hours)
6. Caffeine (3 hours)
  - Effects on very high intensity, short-term exercise.
  - Effects on high intensity exercise of moderate duration.
  - Effects on endurance performance.
7. Creatine (3 hours)
  - Effects on anaerobic exercise performance.
  - Effects on muscle mass.
8. Herbs as Ergogenic Aids and Weight Loss Agents (3 hours)
  - Ginseng and related compounds
    - Chinese and Japanese ginseng
    - Russian or Siberian ginseng (*Eleutherococcus senticosus*)
    - Endurox
  - Ephedra/ephedrine and pseudoephedra
    - Products containing ephedrine, caffeine and aspirin
  - Hydroxycitrate / *Garcinia cambogia*
  - Citrus Aurantium
  - Yohimbine
9. Amphetamines and Central Nervous System Stimulants (3 hours) Amphetamines
  - Bromantan
  - Mesocarb
10. Nutrients, Vitamins and Micronutrients As Potential Ergogenic Aids (3 hours) Insulin
  - action enhancers: Chromium, Vanadium
  - Carnitine
  - HMB ( $\beta$ -hydroxy- $\beta$ -methylbutyrate)
  - Protein supplements and amino acids
    1. The importance of nutrient timing
      - Whey protein
      - Leucine
      - Glutamine
      - Branched chain amino acids
  - Antioxidants
11.  $\beta$ -Adrenergic Antagonists (3 hours)
12. Other Ergogenic Aids or Practices, and Abused Drugs in Sports (3 hours)
  - Bicarbonate loading
  - Diuretics
    - Use of diuretics to induce fluid loss
    - Acetazolamide and exercise at altitude
  - Glycerol
  - Oxygen breathing
13. Popular Over-The-Counter Supplements (3 hours)
  - Pyruvate
    - Use as weight loss agent
    - Potential ergogenic effects
  - Conjugated Linoleic Acid
  - Ribose
  - $\alpha$ -lipoic Acid
  - Tribestan (*Tribulus terrestris*)

**Required Text:**

Antonio J. & Stout J.R. (2002). *Supplements for endurance athletes*. Human Kinetics.

**Methods of Instruction:**

Lecture and discussion, reading and discussion of scientific literature

**Suggested Student Activities:**

Major Assignment – Each student must submit a paper and give a presentation relevant to the following assignment.

**Paper:** As the coach of a mediocre team in the sport of your choosing, the other coaches in the conference decide to allow you to use 4 different ergogenic substances/supplements for the athletes on the team. (An ergogenic aid can include a class of compounds for counting purposes. For example, if you chose Anavar and Deca-

Durabolin, which are both anabolic steroids, this would count as one ergogenic aid.) . For this assignment, do not be concerned with the ethics or legality of these substances. Choose four ergogenic aids that might be most beneficial for athletes on the team. Your selections must include at least one pharmacological and one nutritional ergogenic aid. You may want to choose an ergogenic aid that is beneficial for a certain group of athletes on the team such as all linemen or defensemen on a football team, or you may choose one that may be beneficial to players at all positions. Thoroughly discuss the benefits each ergogenic aid would have and how these ergogenic effects are brought about. Also, discuss dosage and usage patterns and the potential side effects of each ergogenic aid or supplement that you have selected.

For each ergogenic aid / nutritional supplement that you select, you must provide a minimum of 3 valid sources of information. These references can include peer reviewed scientific papers and textbooks (other than the course text). Websites may be used to glean ideas, but do not count as valid information sources. You must use citations and references in your paper. You may use any appropriate style for your citations and references. **(Objectives: 1, 3, 4, 5, 6, 7, 8)**

**Presentation:** Students will work in groups of two in order to prepare and present a 12-minute talk. Presentations will be at an assigned time.

*Your grade on the paper and presentation will depend upon the following:*

1. Effectiveness of the four ergogenic aids/supplements that you select.
2. Strength of the paper: scientific reasoning, the evidence that you provide that supports the effectiveness of the ergogenic aids, composition and grammar.
3. Strength of the references used
4. Effectiveness of the presentation, including communication skills, scientific reasoning, and the evidence that you provide that supports the effectiveness of the ergogenic aids.

This assignment will constitute 25% of the final grade. (Objectives: 1, 3, 4, 5, 6, 7, 8)

### **Additional Assignments:**

There may be one or more reading assignments from the scientific literature on topics related to doping and supplement use. Students are expected to be prepared to discuss the article. Also, quizzes may be given regarding the assigned articles. Class participation, performance on assignments and quizzes for *each* reading assignment will constitute 5% of the course grade. (Objectives: 1, 2, 3, 7)

### **MSU Honor Code:**

**“As a Mississippi State University student, I will conduct myself with honor and integrity at all times. I will not lie, cheat, or steal, nor will I accept the actions of those who do.”**

Honesty and integrity are expected of every student. All occurrences of academic misconduct will be dealt with in accordance with the guidelines and procedures outlined in the *Academic Misconduct Policy*. The Policy can be accessed at [www.msstate.edu/dept/audit/1207.html](http://www.msstate.edu/dept/audit/1207.html).

Additional university policies can be accessed at: [www.msstate.edu/web/student\\_policies.html](http://www.msstate.edu/web/student_policies.html).

Cellular Phones: It is expected that students will show respect for the instructor as well as their peers by turning off their cellular phones before entering the classroom. A student may incur, at my discretion, a deduction of a full letter grade (final grade) each time their cellular phone “rings or vibrates loudly” in the classroom. Should the student answer the phone in class, the student may be expelled from the class (unless prior permission has been granted from the professor).

### **Technology:**

Students will be required to use MS power point to develop presentations.

### **Diversity:**

Valuing diversity is successful only when each individual develops a sense of uniqueness as well as a sense of belonging to a larger whole in which purpose exists. The COE values diversity and encourages all students, faculty, and staff to become active participants in the process.

### **Disability:**

Any student who feels s/he may need an accommodation based on the impact of a disability should contact the instructor privately to discuss specific needs. Student Support Services is available to assist in determining classroom accommodations that are most appropriate for students with disabilities based on documentation of their disability. Examples of classroom accommodations are varied, but may include: Adapted testing arrangements, extended time on

tests, assistance with ordering recorded texts, and access to special equipment. The Student Support Services Website is <http://www.sss.msstate.edu/>

**Field Component:** None

**Evaluation of Student Progress:**

Exams:

There will be two exams, including the final exam, for the semester that will be announced at least one week before the exam. The date and time for the final exam will be scheduled during the semester. Exams can include multiple choice, multiple answer multiple choice, fill-in-the-blank, short answer and essay. Each exam will count equally towards the final grade. The value of each exam will be no greater than 37.5% of the final grade; the value of each exam will be dependent on the number of additional graded assignments.

Late and Missed Exams:

Any student late for an exam will not be allowed to take the exam after the first person has finished. Any student missing an exam must submit a written excuse to the instructor on the first day of return. Failure to submit the proper excuse and failure to make up the exam will result in a zero for the exam. Acceptable excuses are discussed in the *Academic Operating Policy and Procedure Manual* (<http://www.msstate.edu/dept/audit/1209.html>).

Video Assignments:

Position papers will be written for the class based on guidelines provided on blackboard.

Major Assignment:

Each student must submit papers based on approved topics from the instructor and submit/give a presentation relevant to the approved topic to the class.

Additional Assignments:

There may be one or more reading assignments from the scientific literature on topics related to doping and supplement use. Students are expected to be prepared to discuss the article. Also, quizzes may be given regarding the assigned articles. Class participation, performance on assignments and quizzes for *each* reading assignment will constitute 5% of the course grade.

**Grading Scale:**

A = 90% or above

B = 80 - 89%

C = 70 - 79%

D = 60 - 69%

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