Course Description and Objectives: This course combines passion for epigenetics and nutrition with expertise in exercise physiology. Students will learn the basic science behind nutrition- and exercise-induced changes in function (physiology) and body form (phenotype) as they relate to epigenetic modifications at the cellular level. In addition, students will learn the basics of exercise program design and how to perform specific exercises to induce goal-specific physiological and epigenetic changes. Students will also learn how to design controlled clinical intervention studies by implementing what they learn in class throughout the semester. The primary goals of the course are to: 1) help you (the student) understand the core concepts of epigenetics, nutriepigemonics and exercise epigenetics and 2) to provide the unique opportunity to apply these principles in a laboratory setting by performing standard physiological tests in your very own nutrition/exercise training model - YOU.

Course Design: On Mondays, the class will follow a traditional lecture format. On Wednesdays and Fridays, the first ¼ to ½ of the class will be lecture format and the second half of class will involve a supervised exercise training session.

Grad Student Enrollment: Students taking this course for graduate credit will be graded using different criteria. Please see details in the Evaluation and Course Requirement Section.

Textbook
Readings will be provided on Blackboard.

Equipment
Required: Quality workout shoes and a positive attitude.

Evaluation and Course Requirements

<table>
<thead>
<tr>
<th>Undergraduate Students</th>
<th>Graduate Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 Quizzes (20 pts each)</td>
<td>1002 Class Presentations (100 pts each)</td>
</tr>
<tr>
<td>Training/Activity Participation</td>
<td>100 Training/Activity Participation</td>
</tr>
<tr>
<td>Project Participation</td>
<td>100 Project Participation</td>
</tr>
<tr>
<td>Reflection Paper</td>
<td>100 Reflection Paper</td>
</tr>
<tr>
<td>Undergraduate Student Total</td>
<td>400 Data Collection Supervision (100 pts each)</td>
</tr>
<tr>
<td></td>
<td>Graduate Student Total</td>
</tr>
</tbody>
</table>
Quizzes (undergrads only): Each quiz will test content knowledge from the lectures.

Training/Activity Participation (Training Days) (undergrads and grads)- Each week you are required to attend 2 weekly training sessions as a group on Wednesday and Friday. After the first three weeks of class, you are also required to complete one training session on your own, outside of class and report your training activities. During all training sessions, it is highly encouraged to train with a partner when executing compound lifts.

Project Participation (Weekly Training Reports) (undergrads and grads)- Both undergraduate and graduate students will be responsible for turning in his/her own weekly training, sickness, injury and burnout reports. Pre/Post data (8RM strength testing, height/weight and BMI, dietary and physical activity analysis, burnout analysis) collection information will also be provided. All students will be responsible for participation in Pre/Post data collection sessions. Each student will also be responsible for obtaining this data for the completion of their final reflection paper.

Reflection Paper (undergrads and grads): All students will complete a 3 page reflection paper at the end of the semester, to be turned in during the exam period. Details will be discussed in class.

Graduate Student Class/Activity Presentations: Graduate students must complete 2 class presentations and 2 warmup activities as a part of their course requirement. Details are discussed in a separate handout.

Graduate Student Data Collection Supervision: Graduate students must participate in organizing and helping obtain Pre/Post measurements.

Drop Policy - If you are unable to obtain MD approval, to keep up with the training schedule, your attendance is poor or you are unable or unwilling to complete any of the required aspects of the course (e.g., quizzes, labs, training) you will be asked to drop or withdraw from the course.

Attendance of Training Sessions - You will NOT be graded on your physical abilities. You will be “graded” for attending training sessions and giving 100% of your effort. Your instructor understands that there are several things that could prevent you from training, but poor scheduling or other commitments will not be a valid excuse for not attending required training sessions.

Make up policy- Quizzes, participation/project points, and papers cannot be made up. No exceptions.

Campus Emergency: In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances beyond the instructor’s control. Here are ways to get information about changes in this course.

- Blackboard (http://www.itap.purdue.edu/learning/tools/blackboard/)
- Instructor’s email: thenagan@purdue.edu or bstefans@purdue.edu
- Instructor’s phone: 765-494-4536 or 765-494-4401
## Tentative Class Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Week Beginning</th>
<th>Monday</th>
<th>Wednesday</th>
<th>Friday</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>August 25</td>
<td>Introduction, class, login for weekly logs and expectations; Gym Etiquette</td>
<td>General weight lifting plan design</td>
<td>General RT Plan Design</td>
</tr>
<tr>
<td>2</td>
<td>September 1</td>
<td>LABOR DAY</td>
<td>Exercise Testing Techniques</td>
<td>Skeletal Muscle Structure</td>
</tr>
<tr>
<td>3</td>
<td>September 8</td>
<td>Skeletal Muscle Physiology and Metabolism</td>
<td>Quiz 1</td>
<td>Skeletal Muscle Contraction</td>
</tr>
<tr>
<td>4</td>
<td>September 15</td>
<td>Creating a Plan for Hypertrophy or Endurance</td>
<td>Creating a Plan for Strength or Power</td>
<td>What is Plyometrics? Anatomy of Lifts</td>
</tr>
<tr>
<td>5</td>
<td>September 22</td>
<td>Physiological adaptations for hypertrophy and strength</td>
<td>Physiological adaptations for endurance</td>
<td>Periodization, progressive overload and circuit training</td>
</tr>
<tr>
<td>6</td>
<td>September 29</td>
<td>Quiz 2</td>
<td>Exercise, inflammation and disease</td>
<td>Introduction to plyometrics</td>
</tr>
<tr>
<td>7</td>
<td>October 6</td>
<td>Intro to Epigenetics</td>
<td>Obesity and Epigenetics</td>
<td>Exercise and Epigenetics</td>
</tr>
<tr>
<td>8</td>
<td>October 13</td>
<td>OCTOBER BREAK</td>
<td>Inflammation and Epigenetics</td>
<td>Inflammation and Epigenetics II</td>
</tr>
<tr>
<td>9</td>
<td>October 20</td>
<td>Anti-inflammatory exercise: role of epigenetics</td>
<td>Quiz 3</td>
<td>Role of epigenetic modifications in health maintenance</td>
</tr>
<tr>
<td>10</td>
<td>October 27</td>
<td>Epigenetic aberrations in chronic diseases</td>
<td>Epigenome-wide association studies</td>
<td>Nutrition as a modulator of the epigenome</td>
</tr>
<tr>
<td>11</td>
<td>November 3</td>
<td>Effects of dietary compounds on DNA methylation</td>
<td>Adipose Tissue Distribution and Breast Cancer, emphasis on epigenetics</td>
<td>Quiz 4</td>
</tr>
<tr>
<td>12</td>
<td>November 10</td>
<td>Effects of dietary compounds on histone covalent modifications</td>
<td>Effects of dietary compounds on non-coding RNA mechanisms</td>
<td>Remodelling the epigenome by nutritional interventions in chronic diseases</td>
</tr>
<tr>
<td>13</td>
<td>November 17</td>
<td>Remodelling cancer epigenome by nutritional interventions</td>
<td>Part I: Epigenomics: A new bridge between environmental exposures in prenatal/early life and disease onset later in life</td>
<td>Part II: Epigenomics: A new bridge between environmental exposures in prenatal/early life and disease onset later in life</td>
</tr>
<tr>
<td>14</td>
<td>November 24</td>
<td>Reflection paper requirements</td>
<td>THANKSGIVING</td>
<td>THANKSGIVING</td>
</tr>
<tr>
<td>15</td>
<td>December 1</td>
<td>Quiz 5</td>
<td>Part III: Epigenomics: A new bridge between environmental exposures in prenatal/early life and disease onset later in life</td>
<td>Last RT day</td>
</tr>
<tr>
<td>Date</td>
<td>Event</td>
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<tr>
<td>December 8</td>
<td>Graduate Student Presentations</td>
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<td></td>
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<tr>
<td>December 15</td>
<td>Reflection papers due</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>FINALS WEEK</td>
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</tbody>
</table>

****Due to circumstances that may arise during the semester, this schedule is subject to change at the discretion of the instructor.****