I. Course Description
This course focuses on nutrigenomics, the effect of diet on gene expression, and nutrigenetics, how genetic differences affect nutrient uptake and metabolism. It combines instructor and student led presentations focused on how diet and underlying genetics interact to affect molecular phenotypes and ultimately susceptibility to disease. Weekly readings are assigned to all students and students will present 1-2 times on specific topics.

II. Contact information
**Brian J. Bennett, PhD**
Primary Work Location: Nutrition Research Institute, Kannapolis, NC
In Chapel Hill: 5076 Genetics Medicine Building
Phone 704-250-5044

**Saroja Voruganti, Ph.D.**
Primary Work Location: Nutrition Research Institute, Kannapolis, NC
Phone: 704-250-5009

Office Hours: By appointment. Please email to arrange (bennettb@email.unc.edu, saroja@unc.edu)

III. Textbooks
None. Various required reading assigned (Sakai)

IV. Student Learning Outcomes covered in this course:
Upon completion of this course, students will be able to demonstrate the following:
• Knowledge of how diet and underlying genetics interact to increase susceptibility to disease
• Appreciation for the methods and strategies used to study complex trait genetics and nutrition.
• Understanding of the application of -omics scale approaches to measure the effect of diet

V. Learning Experiences:
When assigned to take leadership on a specific topic, students are expected to do the following:
1. Prepare a presentation on the assigned topic, of ~30-45 minutes in length.
   • Following the presentation, guide a class discussion on the topic ~30-45 minutes in length.
   • Students may either use the preselected papers or students may select alternative papers representative of the assigned topic, and notify instructor at least 2 weeks in advance. Instructor will consult with student to ensure alternative papers are appropriate.
2. Final project consists of a 5-page paper that is a mock grant submission

VI. Grading
Students are expected to attend all classes. Special allowances will be made for students with legitimate conflicts that are communicated in advance (whenever possible).
Students are expected to come to class prepared: this requires that you carefully read the assigned articles, and do any additional background reading that might be required to understand the topic.
Participation in class discussions: 35%
Presentation(s) 40%
Final Project 25%

Policy
>93% H
75-92% P
70-74% L
Below 70% F
### Tentative Course Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Lecture Topic</th>
<th>Presentation</th>
<th>Presentation leader</th>
<th>Suggested readings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1/11/16</td>
<td>Overview of course</td>
<td>Principles of nutrigenetics, nutrigenomics and population genetics (describe approaches to studying nutrients and genetics in populations)</td>
<td>Brian Bennett/Saroja Voruganti</td>
<td>(1, 2)</td>
</tr>
<tr>
<td>2</td>
<td>1/18/16</td>
<td>MLK Day</td>
<td>XXXXXXXXXXXXXXX</td>
<td>XXXXXXX</td>
<td>XXXXX</td>
</tr>
<tr>
<td>3</td>
<td>1/25/16</td>
<td>Introduction to Genetics</td>
<td>Introduction to Genetics- Model organisms</td>
<td>Brian Bennett</td>
<td>(3, 4)</td>
</tr>
<tr>
<td>4</td>
<td>2/1/16</td>
<td>Human Genetics</td>
<td>Basic concepts in human genetics and gene x environment interaction</td>
<td>Saroja Voruganti</td>
<td>(5-8)</td>
</tr>
<tr>
<td>5</td>
<td>2/8/16</td>
<td>Nutrigenetic differences in various populations</td>
<td>Genetic basis of nutritional differences in various populations</td>
<td>Geetha Chittoor</td>
<td>(9,10)</td>
</tr>
<tr>
<td>6</td>
<td>2/15/16</td>
<td>Nutrigenetics and nutrigenomics – a critical review of literature</td>
<td>Nutrigenetics and nutrigenomics of atherosclerosis</td>
<td>Saroja Voruganti/Brian Bennett</td>
<td>(11,12)</td>
</tr>
<tr>
<td>7</td>
<td>2/22/16</td>
<td>Student presentations</td>
<td>Diet and gut microbiome</td>
<td></td>
<td>(13,14)</td>
</tr>
<tr>
<td>8</td>
<td>2/29/16</td>
<td>Student presentations</td>
<td>Amylase and copy number/Bitter taste and obesity</td>
<td></td>
<td>(15,16) or (17,18)</td>
</tr>
<tr>
<td>9</td>
<td>3/7/16</td>
<td>Student presentations</td>
<td>GWAS of macronutrient intake/Mediterranean diet</td>
<td></td>
<td>(19,20) or (21-23)</td>
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<tr>
<td>10</td>
<td>3/14/15</td>
<td>SPRING BREAK</td>
<td>XXXXXXXXXXXXXXX</td>
<td>XXXXXXX</td>
<td>XXXXX</td>
</tr>
<tr>
<td>11</td>
<td>3/21/14</td>
<td>Student presentations</td>
<td>FTO and weight loss/diet and telomere shortening</td>
<td></td>
<td>(24-26)</td>
</tr>
<tr>
<td>12</td>
<td>3/28/14</td>
<td>Student presentations</td>
<td>Diet and 9p21 Instructor will issue a program announcement (PA) and solicit grant proposals from the students. Each student will give a presentation and the instructor and other students will act as reviewers and critique the proposal starting on Nov 20</td>
<td></td>
<td>(27-28)</td>
</tr>
<tr>
<td>13</td>
<td>4/4/14</td>
<td>XXXXXXXXXXXXXXX</td>
<td>Write up proposal</td>
<td>XXXXXXXXXXXXXXX</td>
<td>XXXXXXXXXXXXXXX</td>
</tr>
<tr>
<td>14</td>
<td>4/11/14</td>
<td>Student presentations</td>
<td>Effects of parental diet on offsprings/developmental origins of disease</td>
<td></td>
<td>FASEB</td>
</tr>
<tr>
<td>15</td>
<td>4/18/14</td>
<td>Final Project due</td>
<td>Email the grant proposal to <a href="mailto:bennettb@email.unc.edu">bennettb@email.unc.edu</a> and <a href="mailto:saroja@unc.edu">saroja@unc.edu</a> with subject line of Nutrigenetics and Nutrigenomics -Final</td>
<td>XXXXXXX</td>
<td>XXXXX</td>
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### Course readings