<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Lecturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/10</td>
<td>Organizational Meeting</td>
<td>Mary Mullins/ Patrick Seale</td>
</tr>
<tr>
<td>1/12</td>
<td>Cell lineage and fate maps; Introduction to genetics</td>
<td>Mary Mullins</td>
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<tr>
<td>1/13</td>
<td>No Discussion</td>
<td>Mary Mullins</td>
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<tr>
<td>1/17</td>
<td>Body plan formation: Gastrulation, germ layer formation and morphogenesis</td>
<td>Dan Kessler</td>
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<tr>
<td>1/19</td>
<td>Induction of the primary germ layers and the MBT</td>
<td>Dan Kessler</td>
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<tr>
<td>1/20</td>
<td>Discussion</td>
<td>DK</td>
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<tr>
<td>1/24</td>
<td>Creating periodic patterns: The mechanisms revealed after genetics and molecular biology the molecular logic</td>
<td>Shawn Little</td>
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<tr>
<td>1/26</td>
<td>Establishment of the AP and DV axes in Drosophila</td>
<td>Shawn Little</td>
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<tr>
<td>1/27</td>
<td>Discussion</td>
<td>MM</td>
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<tr>
<td>1/31</td>
<td>Morphogens in patterning</td>
<td>Mary Mullins</td>
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<tr>
<td>2/2</td>
<td>The vertebrate dorsal organizer and neural induction</td>
<td>Mary Mullins</td>
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<tr>
<td>2/3</td>
<td>Discussion</td>
<td>MM</td>
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<tr>
<td>2/7</td>
<td>Somitogenesis; Muscle developmental programs</td>
<td>Patrick Seale</td>
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<tr>
<td>2/9</td>
<td>Neural crest development</td>
<td>Patrick Seale</td>
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<tr>
<td>2/10</td>
<td>Discussion</td>
<td>PS</td>
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<tr>
<td>2/14</td>
<td>Establishing neuronal identity along the dorsoventral neuraxis, Cilia and Shh signaling</td>
<td>Doug Epstein</td>
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<tr>
<td>2/16</td>
<td>Vascular development</td>
<td>Mark Kahn</td>
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<tr>
<td>2/17</td>
<td>Discussion</td>
<td>DE</td>
</tr>
<tr>
<td>2/21</td>
<td>Cell polarity and asymmetric cell divisions</td>
<td>Eric Witze</td>
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<tr>
<td>2/23</td>
<td>Topics in early mouse development and organogenesis</td>
<td>Ben Stanger</td>
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<tr>
<td>2/24</td>
<td>Discussion (Send out MIDTERM EXAM)</td>
<td>PS</td>
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<tr>
<td>2/28</td>
<td>Scaling in development</td>
<td>Matt Good</td>
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<tr>
<td>3/2</td>
<td>Single cell tracking and cell specification events</td>
<td>John Murray</td>
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<tr>
<td>3/3</td>
<td>Exam Due (No Discussion)</td>
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</tbody>
</table>
3/4-3/12  Spring Break

3/14  Introduction and history of stem cell field  John Gearhart

3/16  Principles of stem cells in development  Chris Lengner

3/17  Discussion  MM

3/21  Stem cell niches in development  Steve DiNardo

3/23  Hematopoietic stem cells in the embryo and adult  Nancy Speck

3/24  Discussion  PS

3/28  Epigenetics in development  Marisa Bartolomei

3/30  Transcriptional memory in development  Maya Capelson

3/31  Discussion  PS

4/4  Development and genetics of zebrafish: the germ line  Mary Mullins

4/6  piRNA regulation in the germ line  Jeremy Wang

4/7  Discussion  MM

4/11  Metabolism and development  Patrick Seale

4/13  Left-right patterning  Dan Kessler

4/14  Discussion  DK or PS

4/18  Regeneration  Faye Mourkioti

4/20  Muscle satellite cells and regeneration  Faye Mourkioti

4/21  Discussion  PS

4/25  Evo-Devo  Send out FINAL EXAM  Steve DiNardo

5/2  FINAL EXAM Due
Course directors:  
Mary Mullins  
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1152 BRBII/III  
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Course faculty:  
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Jeremy Wang, pwang@vet.upenn.edu  
Eric Witze, ewitze@exchange.upenn.edu

Class Schedule:  
Lectures: 1:30-3:00 on Tuesday and Thursday in Room 1101 BRB II/III (unless otherwise noted on syllabus)  
Discussions: Friday 1:30-2:30, in Room 1101 BRB II/III

Highly Recommended Text:  
Developmental Biology (now in 10th edition) by Scott F. Gilbert (Used on Amazon for ~$20)

Discussions: Each week one research article will be assigned for mandatory reading. One student each week will be required to present background material to the article to the rest of the class and lead the discussion. All students will be involved in presenting the articles at each meeting.

Students not doing a presentation of background material (if more than 12 students are enrolled) will be required to do a “News & Views” paper (only for MM or PS Discussions), which will be due to Mary or Patrick the day of the Discussion. The “News & View” will put the Discussion paper in the context of its field, highlighting the research advance, and should not simply be a summary of the paper. It is a viewpoint, so personal opinions can be included, including your view of potential deficiencies and advances of the article.

Guidance for writing the “News & Views”:
--The main finding presented by the paper should be mentioned in a succinct opening paragraph to attract the attention of those who are not experts in the field.
--More detail, background and explanation should follow, including your own views. Finish off with comments on the implications of the new work and on future research directions.
--No more than 1000 words; 1 figure (optional). Most readers will have a general scientific background, so specialized terminology should be avoided.

**Exams:**
The midterm and final exams will be take-home written exams in essay format.

**Grading:**
Grades will be based on the background presentation (or N&V paper) (20%), participation in the discussion sessions and attendance (20%), the midterm exam (30%), and the final exam (30%).

**Course Website:**
A course website is available at the Penn CANVAS site. The website includes the course schedule, syllabus, faculty contact information and discussion papers for download. In addition, course lectures will be posted as Powerpoint files following each lecture.