

## Calendar

| W/k | Mon   |  | Wed   |  |
|-----|---|--|---|--|
| 1   |   |  | <b>January 05</b> <span style="float: right;"><b>Lecture 1</b></span><br><b>Discussion #1</b>               |  |
|     |   |  | <b>Speaker</b><br>Ivanova<br>Dinov  | <b>Topic</b><br>Class overview<br>Math refresh<br>Intro to R-package (terms)   |
| 2   | <b>January 10</b> <span style="float: right;"><b>Lecture 2</b></span>                                   |  | <b>January 12</b> <span style="float: right;"><b>Lecture 3</b></span><br><b>Assignment Homework #1</b>      |  |
|     | <b>Speaker</b><br>Dinov   | <b>Topic</b><br>Exponential Decay<br>(Chapter 2 Hobbie & Roth)<br>R-package installation                     | <b>Speaker:</b><br>Ivanova  | <b>Topic</b><br>Biomechanics (Chapter 1<br>Hobbie & Roth Chapters 1-5,<br>Davidovits)  |
| 3   | <b>January 17</b><br><i>Martin Luther King Jr. day – no classes</i>                                     |  | <b>January 19</b> <span style="float: right;"><b>Lecture 4</b></span><br><b>Paper Presentations</b>         |  |
|     |   |  | <b>Speaker</b><br>Ivanova   | <b>Topic</b><br>Biomechanics / Systems of<br>many particles (Chapter3<br>Hobbie & Roth)  |
| 4   | <b>January 24</b> <span style="float: right;"><b>Lecture 5</b></span><br><b>Homework #1 is due 11pm</b> |  | <b>January 26</b> <span style="float: right;"><b>Lecture 6</b></span><br><b>Assignment Homework #2</b>      |  |
|     | <b>Speaker</b><br>Dinov   | <b>Topic</b><br>The Method of Least<br>Squares and Signal<br>Analysis (Chapter 11,<br>Hobbie & Roth)         | <b>Speaker</b><br>Ivanova   | <b>Topic</b><br>Transport in an infinite<br>medium<br>Transport through neutral<br>membranes (Chapters 4 and<br>5 Hobbie & Roth) |
| 5   | <b>January 31</b> <span style="float: right;"><b>Lecture 7</b></span><br><b>Discussion #2</b>           |  | <b>February 02</b> <span style="float: right;"><b>Lecture 8</b></span>                                      |  |
|     | <b>Speaker</b><br>Ashton Miller<br>(confirmed)  | <b>Topic</b><br>Biomechanics of bone<br>fracture   | <b>Speaker</b><br>Ivanova   | <b>Topic</b><br>Impulses in nerve and<br>muscle cells<br>(Chapters 6 Hobbie & Roth)  |
| 6   | <b>February 7</b> <span style="float: right;"><b>Lecture 9</b></span><br><b>Homework #2 is due</b>      |  | <b>February 09</b> <span style="float: right;"><b>Lecture 10</b></span><br><b>Assignment final paper</b>    |  |
|     | <b>Speaker</b><br>Ivanova   | <b>Topic</b><br>ECG & The exterior<br>potential and the<br>electrocardiogram<br>(Chapter 7 Hobbie &<br>Roth) | <b>Speaker</b><br>Dinov   | <b>Topic</b><br>Theory: images and imaging<br>data (Chapter 12, Hobbie &<br>Roth)  |
| 7   | <b>February 14</b> <span style="float: right;"><b>Lecture 11</b></span>                                 |  | <b>February 16</b> <span style="float: right;"><b>Lecture 12</b></span>                                     |  |
|     | <b>All students</b>   | <b>Presentation of<br/>Assignment #1</b>   | <b>Topic</b><br>Berenfeld   | <b>Speaker</b><br>The mechanisms of cardiac<br>fibrillation  |
| 8   | <b>February 21</b> <span style="float: right;"><b>Lecture 13</b></span>                                 |  | <b>February 23</b> <span style="float: right;"><b>Lecture 14</b></span><br><b>Assignment of Homework #3</b> |  |
|     | <b>All students</b>   | <b>Presentation of<br/>Assignment #1</b>   | <b>Speaker</b><br>Dinov   | <b>Topic</b><br>Practice: Processing imaging data  |
| 9   | <b>February 28</b><br><i>Spring Break – no classes</i>  |  | <b>March 2</b><br><i>Spring Break – no classes</i>  |  |

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| 10 | <i>March 7</i><br><i>Discussion #3</i>   | <i>Lecture 15</i>   | <i>March 9</i><br><i>Lecture 16</i>                              |   |
|    | <b>Speaker</b><br>Scott Peltier  | <b>Topic</b><br>fMRI  | <b>Speaker</b><br>Chenevert                                      | <b>Topic</b><br>MRI   |
| 11 | <i>March 14</i><br><i>Homework #3 is due</i>   | <i>Lecture 17</i>   | <i>March 16</i><br><i>Lecture 18</i>                             |   |
|    | <b>Speaker</b><br>Dinov  | <b>Topic</b><br>R-package practice and discussion   | <b>Speaker</b><br>Ivanova  | <b>Topic</b><br>Atoms and Light (Chapter 14 Part I Hobbie & Roth)   |
| 12 | <i>March 21</i><br><i>Assignment of Midterm exam</i><br><i>Midterm is due March 27</i> | <i>Lecture 19</i>   | <i>March 23</i><br><i>Assignment Homework #4</i>                 | <i>Lecture 20</i>   |
|    | <b>Speaker</b>   | <b>Topic</b>  | <b>Speaker</b><br>Ivanova  | <b>Topic</b><br>Atoms and Light<br>(Chapters 14 Hobbie & Roth)  |
| 13 | <i>March 28</i><br><i>Lecture 21</i>   |   | <i>March 30</i><br><i>Discussion #4</i>                          | <i>Lecture 22</i>   |
|    | <b>Speaker</b><br>Ivanova  | <b>Topic</b><br>Interaction of photons and charged particles with matter (Chapter 15 Hobbie & Roth) | <b>Speaker</b><br>Sundares Ram<br>Postdoc in Galban lab          | <b>Topic</b><br>X-Ray Computed Tomography (CT): imaging technique for the detection of lung and bone cancer |
| 14 | <i>April 04</i><br><i>Homework #4 is due</i>   | <i>Lecture 23</i>   | <i>April 06</i><br><i>Assignment Homework #5</i>                 | <i>Lecture 24</i>   |
|    | <b>Speaker</b><br>Ivanova  | <b>Topic</b><br>Medical Uses of X-Rays (Chapter 16 Hobbie & Roth)                                   | <b>Speaker</b><br>Ivanova  | <b>Topic</b><br>Sound and Ultrasound: (Chapter 13 Hobbie & Roth)  |
| 15 | <i>April 11</i><br><i>Lecture 25</i>   |   | <i>April 13</i><br><i>Discussion #5</i>                          | <i>Lecture 26</i>   |
|    | <b>Speaker</b><br>Mario Fabilli  | <b>Topic</b><br>Imaging with ultrasound   | <b>Speaker</b><br>Ivanova  | <b>Topics</b><br>Closing notes  |
| 16 | <i>April 19</i><br><i>Last Day of Classes</i><br><i>Homework #5 is due</i>             | <i>Lecture 27</i>   | <i>Final exam</i><br><i>Final paper is due midnight April 27</i> | <i>1:30 pm - 3:30 pm April 25</i>   |
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