Biology 181 is designed to present a realistic picture of how science is done. An additional objective is to acquaint prospective Biology majors with fields of study in biology and with the research of faculty in Biology and related departments. If you have any questions concerning Biology 181, please talk with either Paul Stein or Pamela Peters before or after class or make an appointment.

DESCRIPTION: The course consists of a series of 14 class meetings. 13 meetings will be research lectures given by different faculty members on topics of the professor's interest. 1 meeting will include lectures by Biology 500 students on their undergraduate research. Class meetings will be on Tuesdays from 3:30pm-5:00pm in Room 322 in Rebstock Hall.

See the course website http://www.nslc.wustl.edu/courses/Bio181/bio181.html for the up-to-date lecture schedule, the PDFs for readings, and the background information for each speaker. Enter user name: bio181 and password provided in class to access PDFs. Credit for the course is 1 unit PASS/FAIL only. No letter grades will be issued. This does not interfere with your ability to take another Cr/NCr course.

REQUIREMENTS:

1. CLASS MEETINGS: Students are required to attend at least 10 of the class meetings (see web page for schedule) in order to pass the course. You are expected to take notes at each faculty research lecture to assist you in the preparation of your short papers and to gain skill in note-taking during science lectures. Please print your name and sign your name on a sheet that we will have in the back of the lecture room each week to indicate you attended. It is a serious breach of the honor code for one person to sign in for an absent student. You must be present during the entire duration of the class meeting in order to receive credit for attendance at that meeting. Lectures in Biology 1810 and Chemistry 181 may be substituted for lectures in Bio 181. Arrange for an EMail to stein@wustl.edu from the coursemaster of the course to verify your attendance and receive Bio 181 credit for your attendance. Links to the Bio 1810 home page and the Chem 181 home page are on the Bio 181 home page.

2. READINGS AND TWO SHORT PAPERS: PDFs of articles are posted on the course website for each faculty research lecture to enable you to pursue topics further. You are required to chose 2 of the research topics presented by faculty speakers in Bio 181 lectures and read the PDFs posted for these lectures. You will need to write 2 short papers that each receive a mark of "++" or "+" in order to pass the course. Short papers that receive a mark of "-" will need to be re-written; Pamela Peters will provide suggestions for improvement. Each short paper will be at least 2 pages long and will include:
   (1) a short summary of the main points of the speaker's talk;
   (2) a description of the main points of at least two of the PDF articles associated with the talk;
   (3) suggestions for future experiments in the field OR suggestions for improvements of the current experiments.

   Double space your paper and include a reference list. When you state a claim in your paper based upon an outside source, be sure to reference that source within the text of your paper and to include the specifics of that reference in your reference list. Use the style described in the file titled "2012 Citation Guidelines for Bio 181 Papers" that can be downloaded from the Bio 181 home page. Use headings for the major sections of your paper: Lecture Overview, Article Summaries, Suggestions for Experiments. Use subheadings for major ideas within each of the sections of the paper. Hand in your papers to the course teaching assistant, Pamela Peters. Direct your questions, comments, or concerns with respect to the papers to Pamela Peters. The first short paper is due in class by 3:30pm on October 9, 2012; the second short paper is due in class by 3:30pm on November 13, 2012. The deadline for receipt in class of re-written short papers is 3:30pm on December 4, 2012.

A SPECIAL REQUEST: Biology 181 is an optional course. We offer it because we know that some first-year students are very interested in research. In order to allow the student to test that interest, we ask first-rate research scientists to spend time with you to give you the flavor of biological research. Each year, sometime into the course, some students decide the lectures are not very interesting to them. Fair enough. One of the objectives of the course is to allow students to test the water. If you find that the lectures do not hold your interest, please withdraw from the course. No one needs 1 unit of credit, and the course is meant to be exciting and a pleasure, not punishment. For reasons beyond our understanding, in the past, students who have lost interest continue to attend class, are inattentive, and even rude. This makes for a very unpleasant situation for all concerned. Feel free to withdraw from the class if you lose interest in the material. If you attend the class, please be attentive and, of course, polite.
Biology 181

Freshman Seminar in Biology

Professor: Paul S.G. Stein
Phone: (314) 935-6824
Office: Monsanto 212
EMail: stein@wustl.edu

Teaching Assistant: Pamela Peters
EMail: pamelapeters@wustl.edu

A lecture course intended for first-year students contemplating a major in biology. Each week active researchers describe the biological context of their research, the specific questions they have formulated, the means by which they pursue the answers, and their data and conclusions. Students are expected to attend all lectures. Students will write two short papers; each paper will be based upon a Biology 181 lecture and its associated readings. Must be taken Credit/No Credit. Medium-sized class. Credit 1 unit. Fall Semester, Tuesdays, 3:30PM-5:00PM, Rebstock 322.

- Biology 181 Fall 2012 Schedule
- Biology 181 Fall 2012 Syllabus
- Citation Guide for Biology 181 Short Papers

Students may substitute attendance at Biology 1810 and Chemistry 181 lectures for Biology 181 lectures.

- Bio 1810 Freshman Seminar in Imaging Sciences Fall 2012 Schedule
- Chem 181 Freshman Seminar in Chemical Sciences Fall 2012 Schedule
# Biology 181 Fall Semester 2012 Schedule

**Freshman Seminar in Biology**

- **Bio 181 classes** meet in Rebstock 322 on Tuesdays 3:30pm - 5:00pm
- **Coursemaster:** Paul Stein, Biology Department, EMail: stein@wustl.edu, Phone: (314) 935-6824
- **Teaching Assistant:** Pamela Peters EMail: pamelapeters@wustl.edu
- **Last day to drop course without W** is Wednesday, September 12, 2012.
- **Last day to withdraw from course with W** is Friday, November 16, 2012.
- Paper #1 is due on October 09, 2012; Paper #2 is due on November 13, 2012.

<table>
<thead>
<tr>
<th>Week #</th>
<th>Date</th>
<th>Researcher</th>
<th>Topics and Readings</th>
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<tbody>
<tr>
<td>1</td>
<td>28-Aug-12</td>
<td>Gammon Earhart</td>
<td>From Turtles to Turning to Tango: Studies on the Neural Control of Movement</td>
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<td>1. Randomized Controlled Trial of Community-Based Dancing to Modify Disease Progression in Parkinson Disease</td>
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<td>2. Effect of subthalamic deep brain stimulation on turning kinematics and related saccadic eye movements in Parkinson disease</td>
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<td>3. Podokinetik stimulation causes shifts in perception of straight ahead</td>
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<td>2</td>
<td>4-Sept-12</td>
<td>Erik Herzig</td>
<td>Unwinding the Biological Clock</td>
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<td>1. Vasoactive intestinal polypeptide mediates circadian rhythmicity and synchrony in mammalian clock neurons</td>
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<td>2. Neurons and networks in daily rhythms</td>
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<tr>
<td>3</td>
<td>11-Sept-12</td>
<td>Jan Brunstrom-Hernandez</td>
<td>Cerebral Palsy: Basic Research, Clinical Care, Advocacy</td>
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<td>1. Human Neocortical Development: The Importance of Embryonic and Early Fetal Events</td>
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<td>2. Classification and Definition of Disorders Causing Hypertonia in Childhood</td>
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<td>3. Promotion of Physical Fitness and Prevention of Secondary Conditions for Children With Cerebral Palsy: Section on Pediatrics Research Summit Proceedings</td>
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<td>4. Cerebral Palsy Chapter 40 in Current Management in Child Neurology</td>
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<td>5. Frequency and Severity of Visual Sensory and Motor Deficits in Children with Cerebral Palsy: Gross Motor Function Classification Scale</td>
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<td>4</td>
<td>18-Sept-12</td>
<td>Doug Chalker</td>
<td>Science's Next Top Model: The Organisms of Discovery</td>
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<td>1. Model Organisms</td>
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<td>2. RNA Interference: Big Applause for Silencing in Stockholm</td>
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<td>5</td>
<td>25-Sept-12</td>
<td>Paul Stein</td>
<td>Spinal Cord Control of Limb Movement</td>
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<td>1. A Multiple-Level Approach to Motor Pattern Generation</td>
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<td>2. Neuronal control of turtle hindlimb motor rhythms</td>
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<td>6</td>
<td>2-Oct-12</td>
<td>David Queller and Joan Strassmann</td>
<td>Evolution of Social Behavior</td>
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<td>7</td>
<td>9-Oct-12</td>
<td>Barbara Kunkel</td>
<td>Plant-Microbe Interactions: The Good, The Bad, and The Useful</td>
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<td>1. Partners-in-infection: host proteins involved in the transformation of plant cells by Agrobacterium</td>
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<td>2. Pseudomonas syringae pv. tomato: the right pathogen, of the right plant, at the right time</td>
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<td>3. Prokaryotic Plant Parasites</td>
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| 8    | 16-Oct-12 | Frank Yin   | Biomedical Engineering | 1. Functional Arteries Grown in Vitro  
|      |         |              |                       | 2. Lab-Grown Organs Begin to Take Shape  
|      |         |              |                       | 3. Tissue Engineering  
|      |         |              |                       | 4. Last Piece in the Puzzle |
| 9    | 23-Oct-12 | Kendall Blumer | How Does the Retina Work? | 1. The need for speed  
|      |         |              |                       | 2. Defects in RGS9 or its anchor protein R9AP in patients with slow photoreceptor deactivation |
| 10   | 30-Oct-12 | To Be Arranged | Environmental Biology | 1. Unhealthy Landscapes: Policy Recommendations on Land Use Change and Infectious Disease Emergence  
|      |         |              |                       | 2. Biodiversity and Disease Risk: the case of Lyme Disease |
| 11   | 6-Nov-12 | Kevin Smith  | Biology 500 and Presentations by Undergraduate Researchers | 1. Powerpoint Presentation  
|      |         |              |                       | 2. Biology 200/500 Independent Study  
|      |         |              |                       | 3. Biology Department  
|      |         |              |                       | 4. Undergraduate Studies  
|      |         |              |                       | 5. Students interested in research  
|      |         |              |                       | 6. Washington University/Howard Hughes Medical Institute Summer Undergraduate Research Fellowships (SURF)  
|      |         |              |                       | 7. Research/Job Opportunities  
|      |         |              |                       | 8. Strategy for finding a mentor  
|      |         |              |                       | 9. Help finding a summer job  
|      |         |              |                       | 10. List of potential mentors  
|      |         |              |                       | 11. WU Research Opportunities In Biology and Biomedical Fields Information Sheet  
|      |         |              |                       | 12. Clinical Research Funder Studies at WUSM  
|      |         |              |                       | 13. NIH  
|      |         |              |                       | 14. Community of Scholars  
|      |         |              |                       | 15. AMGEN summer fellowship program |
|      |         |              | Presentations by Biology 500 students | |
| 12   | 13-Nov-12 | Ken Olsen     | The Human Genome: Our Encyclopedia and How to Use It | 1. Welcome to the Genomics Era  
|      |         |              |                       | 2. The "new" genetics and clinical practice  
|      |         |              |                       | 3. The impact of next-generation sequencing technology on genetics  
|      |         |              |                       | 4. Recurring Mutations Found by Sequencing an Acute Myeloid Leukemia Genome  
|      |         |              |                       | 5. Washington University Record Story on 2010 AML Genome  
|      |         |              |                       | 6. Genetics, Epigenetics, and Leukemia  
|      |         |              |                       | 7. DNMT3A Mutations in Acute Myeloid Leukemia  
|      |         |              |                       | 8. A decade's perspective on DNA sequencing technology |
| 13   | 27-Nov-12 | Elaine Mardis | From Frogs to Bacteria: Development Large and Small | 1. The Division Inhibitor EzrA Contains a Seven-Residue Patch Required for Maintaining the Dynamic Nature of the Medial PtsZ Ring  
|      |         |              |                       | 2. The great divide: coordinating cell cycle events during bacterial growth and division |
| 14   | 4-Dec-12 | Petra Anne Levin |                           | |
2012 Citation Guidelines for Bio 181 Papers
Written by Becca Tsevat in Fall 2011 and modified by Paul Stein for the Fall 2012 class.
Becca was the Bio 181 Teaching Assistant in Fall 2011.
She graduated in May 2012 from WashU with a Double Major in English Literature and Biology.

Although each scientific journal has its own citation style, Bio 181 students will use APA style for the papers in the Bio 181 class. Below is a list of guidelines and examples for the types of sources you will most likely be referencing; however, if you are citing a source that is not discussed below, feel free to EMail the 2012 Bio 181 Teaching Assistant, Pamela Peters <pamelapeters@wustl.edu>, with questions or visit the links referenced below.

For In-Text Citations:

Short Quotations
If you are directly quoting from a work, you will need to include the author, year of publication, and the page number for the reference (preceded by "p."). Introduce the quotation with a signal phrase that includes the author's last name followed by the date of publication in parentheses. Be sure to include the full reference in your Bibliography at the end of your paper.

According to Jones (1998), "Students often had difficulty using APA style, especially when it was their first time" (p. 199). Jones (1998) found "students often had difficulty using APA style" (p. 199); what implications does this have for teachers?

If the author is not named in a signal phrase, place the author's last name, the year of publication, and the page number in parentheses after the quotation.

She stated, "Students often had difficulty using APA style" (Jones, 1998, p. 199), but she did not offer an explanation as to why.

Long Quotations
Place direct quotations longer than 40 words in a free-standing block of typewritten lines, and omit quotation marks. Start the quotation on a new line, indented 1/2 inch from the left margin, i.e., in the same place you would begin a new paragraph. Type the entire quotation on the new margin, and indent the first line of any subsequent paragraph within the quotation 1/2 inch from the new margin. Maintain double-spacing throughout. The parenthetical citation should come after the closing punctuation mark.

Jones's (1998) study found the following: Students often had difficulty using APA style, especially when it was their first time citing sources. This difficulty could be attributed to the fact that many students failed to purchase a style manual or to ask their teacher for help. (p. 199)
Summary or Paraphrase

If you are paraphrasing an idea from another work, you need to make reference to the author and year of publication in your in-text reference. APA guidelines also encourage you to provide the page number (although it is not required).

According to Jones (1998), APA style is a difficult citation format for first-time learners. APA style is a difficult citation format for first-time learners (Jones, 1998, p. 199).

For the Reference List:
- When you state a claim in your paper based upon an outside source, be sure to reference that source within the text of your paper and to include the specifics of that reference in your reference list.
- All lines after the first line of each entry in your reference list should be indented one-half inch from the left margin. This is called hanging indentation.
- Authors' names are inverted (last name first); give the last name and initials for all authors of a particular work for up to and including seven authors. If the work has more than seven authors, list the first six authors and then use ellipses after the sixth author's name. After the ellipses, list the last author's name of the work.
- Alphabetize reference list entries by the last name of the first author of each work.
- If you have more than one article by the same author, single-author references or multiple-author references with the exact same authors in the exact same order are listed in order by the year of publication, starting with the earliest.
- Capitalize all major words in journal titles.
- When referring to books, chapters, articles, or Web pages, capitalize only the first letter of the first word of a title and subtitle, the first word after a colon or a dash in the title, and proper nouns. Do not capitalize the first letter of the second word in a hyphenated compound word.
- Italicize titles of longer works such as books and journals.
- Do not italicize, underline, or put quotes around the titles of shorter works such as journal articles or essays in edited collections.

Article from an online journal

Example:
Lecture or Speech
Speaker, A.A. “Title of Speech.” Sponsoring organization, Name of Conference. Location. Date.

Example:

One Author
Last name first, followed by author initials.


Two Authors
List by their last names and initials. Use the ampersand instead of "and."


Three to Seven Authors
List by last names and initials; commas separate author names, while the last author name is preceded by ampersand.


More than Seven Authors

Sources:
http://ia.juniata.edu/citation/apa/index.htm
http://owl.english.purdue.edu/owl/resource/560/01/