Principles of Biology Laboratory
UA 9123L01
1 credit course

Instructor Information
- Dr Valerie Wells
- Tuesday 5pm-6pm or by appointment

Course Information
- Tuesday 1pm-4pm
- Birkbeck College, Main Building, Malet Street, 3rd floor, room 319
- General Chemistry I and ii; Principles of Biology II concurrently

Course Overview and Goals
The course gives the opportunity to carry out experimental scientific inquiry and to acquire knowledge, linked to the foundations of the Principles of Biology I and II lectures. It will provide a direct experience of the most current topics in research, while providing the groundwork for higher level courses at NYU and preparation for future careers. Hypothetical scientific questions will be addressed, research techniques will be carried out, observational skills will be tested and students will develop their scientific writing skills.

Upon Completion of this Course, students will be able to:
- Understand current research methods in Biology
- Carry out selected research techniques
- Understand and carry out Scientific Writing

Course Requirements

Grading of Assignments
The grade for this course will be determined according to these assessment components:
Assignments/Activities | Description of Assignment | % of Final Grade | Due
---|---|---|---
Participation | Punctuality, preparation, conduct, engagement – discussion, questioning, interest, collegiality | 10 | 
Multiple choice quizzes | 8 quizzes, approximately 2.5% each | 20 | 
In lab assignments | Problem solving, 10 assignments, approximately 2.5% each | 25 | 
Scientific Writing | 2000 words; Introduction, methods, Results, Discussion, based on one complete experiment | 20 | 
Final exam | Practical, observational, and analytical skills addressed during the semester, and on knowledge and identification of specimens | 25% | 

Failure to submit or fulfill any required course component results in failure of the class

Grades

Letter grades for the entire course will be assigned as follows:

<table>
<thead>
<tr>
<th>Letter Grade</th>
<th>Percent</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Example: 93.5% and higher</td>
<td>Excellent laboratory work showing a thorough knowledge and understanding of the topics. Problem solving and scientific writing with excellent use of scientific language, detailed analysis and clear logical explanations, showing insight, independent, original thought and reasoning. The scientific writing should reveal a considerable degree of independent reading and research and should include the use of primary reference material.</td>
</tr>
<tr>
<td>B</td>
<td>Example: 82.5% - 87.49%</td>
<td>Good standard of laboratory work with good general knowledge and understanding of the topics. Problem solving and scientific writing with accurate use of scientific language, good general analysis and coherent explanations showing some independent thought and reasoning. The scientific writing should reveal some independent reading and research and may include the use of some primary reference material.</td>
</tr>
<tr>
<td>C</td>
<td>Example: 72.5% - 77.49%</td>
<td>Satisfactory laboratory work, broadly correct both factually and analytically, with some</td>
</tr>
<tr>
<td>Letter Grade</td>
<td>Percent</td>
<td>Description</td>
</tr>
<tr>
<td>-------------</td>
<td>---------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>D</td>
<td>Example: 62.5% - 67.49</td>
<td>Passable laboratory work, showing a general, superficial knowledge and understanding of the topics. Problem solving and scientific writing lacking satisfactory use of scientific language or adequate analysis or reasoned explanations, and very limited background reading.</td>
</tr>
<tr>
<td>F</td>
<td>Example: 59.99% and lower</td>
<td>Unsatisfactory work in assessed criteria</td>
</tr>
</tbody>
</table>

**Course Materials**

**Required Textbooks & Materials**

**REQUIRED:** Campbell Biology 11th edition text book (Urry, Cain, Wasserman, Minorsky, Reece (either hardback or e-text)

**ADVISABLE:**

Text book AND “Mastering Biology available as a package as follows:

- Campbell Biology book, 11th edition (Urry, Cain, Wasserman, Minorsky, Reece) hard back PLUS access to online “Mastering Biology” e-text access package card/code.
- OR Campbell Biology book, 11th edition (Urry, Cain, Wasserman, Minorsky, Reece) e-text PLUS access to online “Mastering Biology” e-text access package card/code.

Access package card/code provides online “Mastering Biology” material with practice multiple choice questions and challenge questions for private study to reinforce and to challenge learning.

**Optional Textbooks & Materials**

A Study Guide to accompany Campbell text book- provides practice multiple choice questions and challenge questions for private study, but these are less extensive than the “Mastering Biology” package

**Resources**

- Access your course materials: [NYU Classes](nyu.edu/its/classes)
- Databases, journal articles, and more: [Bobst Library](library.nyu.edu)
- NYUL Library Collection: [Senate House Library](catalogue.libraries.london.ac.uk)
- Assistance with strengthening your writing: [NYU Writing Center](nyu.mywconline.com)
- Obtain 24/7 technology assistance: [IT Help Desk](nyu.edu/it/servicedesk)
# Course Schedule

<table>
<thead>
<tr>
<th>Session/Date</th>
<th>Topic</th>
<th>Reading: Lab manual pages</th>
<th>Assignment Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>Session 1:</td>
<td>Lab 1 The Art of Pipetting</td>
<td>6,7</td>
<td></td>
</tr>
<tr>
<td>Session 2:</td>
<td>Lab 2 Genotype to Phenotype: PTC analysis: DNA isolation</td>
<td>8-10</td>
<td></td>
</tr>
<tr>
<td>Session 3:</td>
<td>PTC Analysis: PCR and Restriction Digest Lab 3 Genetic Transformation</td>
<td>11,12</td>
<td>18-20</td>
</tr>
<tr>
<td>Session 4:</td>
<td>PTC Analysis: DNA electrophoresis and Analysis Genetic Transformation: Results</td>
<td>13</td>
<td>20</td>
</tr>
<tr>
<td>Session 5:</td>
<td>Lab 5 Tree of Life: Animal Phylogeny: DNA extraction, PCR</td>
<td>32-36</td>
<td></td>
</tr>
<tr>
<td>Session 6:</td>
<td>Animal Phylogeny: Gel electrophoresis, preparation of DNA for sequencing.</td>
<td>37,38</td>
<td></td>
</tr>
<tr>
<td>Session 7:</td>
<td>Animal Phylogeny: Live and prepared specimens</td>
<td>39-42</td>
<td></td>
</tr>
<tr>
<td>Session 9:</td>
<td>Lab 4 RNA Interference: C.elegans. Scientific writing Workshop</td>
<td>22-29</td>
<td></td>
</tr>
<tr>
<td>Session 10:</td>
<td>C.elegans</td>
<td>29</td>
<td>Complete document Scientific Writing</td>
</tr>
<tr>
<td>Session 11:</td>
<td>Classroom Bedford Square: Problem Solving and Embryology Workshop</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Session/Date</td>
<td>Topic</td>
<td>Reading: Lab manual pages</td>
<td>Assignment Due</td>
</tr>
<tr>
<td>--------------</td>
<td>--------------------------------------------</td>
<td>---------------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>Session 12:</td>
<td>Lab 7 Plant Diversity</td>
<td>61-70</td>
<td></td>
</tr>
<tr>
<td>Session 13:</td>
<td>Animal Phylogeny: Visit to Natural History Museum</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Session 14:</td>
<td>Final exam</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Final Assessment:</td>
<td>Personal appraisals</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Co-Curricular Activities

**Mandatory weekend visit** to Cornwall. This visit concerns **ecology** and involves a scientific lecture/discussion/tour of the Humid Tropical and Temperate Biomes at the internationally renowned Eden Project. **The ecology part of the laboratory course is based on this visit.**

Travel and accommodation costs are covered by NYUL. Students are required to purchase only their own food.

Classroom Etiquette

Toilet breaks should be taken before or after class. 
Food & drink, including gum, are not to be consumed in class. 
Mobile phones should be set on silent and left in your bag on the rack provided. 
Laptops are not used in the laboratory classes. 
Please kindly dispose of rubbish in the bins provided outside the laboratory.

NYUL Academic Policies

**Attendance and Tardiness**

- Key information on NYU London's absence policy, how to report absences, and what kinds of absences can be excused can be found on our website (http://www.nyu.edu/london/academics/attendance-policy.html)

**Assignments, Plagiarism, and Late Work**

- You can find details on these topics and more on this section of our NYUL website (https://www.nyu.edu/london/academics/academic-policies.html) and on the Policies and Procedures section of the NYU website for students studying away at global sites (https://www.nyu.edu/academics/studying-abroad/upperclassmen-semester-academic-year-study-away/academic-resources/policies-and-procedures.html).

Classroom Conduct
Academic communities exist to facilitate the process of acquiring and exchanging knowledge and understanding, to enhance the personal and intellectual development of its members, and to advance the interests of society. Essential to this mission is that all members of the University Community are safe and free to engage in a civil process of teaching and learning through their experiences both inside and outside the classroom. Accordingly, no student should engage in any form of behaviour that interferes with the academic or educational process, compromises the personal safety or well-being of another, or disrupts the administration of University programs or services. Please refer to the [NYU Disruptive Student Behavior Policy](#) for examples of disruptive behavior and guidelines for response and enforcement.

**Disability Disclosure Statement**

Academic accommodations are available for students with disabilities. Please contact the Moses Center for Students with Disabilities (212-998-4980 or mosescsd@nyu.edu) for further information. Students who are requesting academic accommodations are advised to reach out to the Moses Center as early as possible in the semester for assistance.

**Instructor Bio**

Valerie Wells is research scientist. Her research is focused on defining differences in the signalling pathways which operate in normal and cancer cells, in order to exploit differences in their genetic makeup which can be targeted to selectively activate programmed cell death in cancer cells while leaving normal cells unharmed. A novel cytokine, beta-GBP (beta-galactoside binding protein), has been identified and cloned and has been found to selectively induce apoptosis in cancer cells and in colon cancer human xenografts in mice. Valerie Wells is currently investigating the molecular signalling pathways activated by βGBP leading to programmed cell death.

Recent publications


Recent participation in International conferences
