Undergraduate Pre-Course Survey  
Spring 2008

Please read this paragraph before you begin filling the survey:

The purpose of this survey is to allow the instructor to survey the extent of your comprehension and abilities to perform basic skills and scientific processes at the time you BEGIN this course.

Reference: Survey adapted from:

DO NOT WRITE ON THIS SURVEY. RECORD YOUR ANSWERS ON THE ANSWER SHEET PROVIDED.
General Information:

1. What is your Gender?
   1. Male  
   2. Female

For questions 2-5 select only one major, otherwise mark none of the above.

2. Declared major
   a. Biology: General Biology emphasis
   b. Biology: Health Science emphasis
   c. Biology: Zoology emphasis
   d. Biology: Botany emphasis
   e. none of the above

3. Declared major
   a. Biotechnology
   b. Wildlife Conservation and Management
   c. Natural Science/Biology
   d. Natural Science/Secondary Education
   e. none of the above

4. Declared major
   a. Biochemistry and Molecular Biology
   b. Chemistry
   c. Medical Technology
   d. none of the above

5. Declared major
   a. Natural Science/Chemistry/Chemical Business Option
   b. Natural Science/Chemistry/Forensic Science Option
   c. Natural Science/Chemistry/Health Professions Option
   d. Natural Science/Chemistry/Education Option
   e. none of the above

6. My primary advisor in the department of
   a. Biology.
   b. Chemistry.
   c. Mathematics.
   d. Psychology.
   e. none of the above

For the following list of courses select one of the following choices:
   a. Completed (includes transfer equivalents and dual credit)
   b. Currently enrolled
   c. Have not taken
   d. Other

7. MAT 116 College Algebra
8. MAT 119 Trigonometry
9. MAT 130 Pre-Calculus
10. MAT 132 Statistics
11. MAT 147 Applied Calculus
12. MAT 167 Calculus with Analytical Geometry I
13. MAT 177 Calculus with Analytical Geometry II
14. MAT 287 Calculus with Analytical Geometry III
15. PHY 110 College Physics I
16. PHY 111 College Physics II
17. PHY 210 University Physics I
18. PHY 211 University Physics II
19. BIO 105 Principles of Biology
20. BIO 115 Ecology and Evolution
21. BIO 205 Genetics
22. BIO 215 Molecular Cell Biology
23. BIO 250 Human A & P
24. BIO 311 Animal Physiology
25. BIO 315 Medical Parasitology
26. BIO 320 Histology
27. BIO 331 Bioinformatics
28. BIO 340 Plant Physiology
29. BIO 390 Microbiology
30. BIO 410 Advanced Cell Biology
31. BIO 411 Developmental Biology
32. BIO 415 Invertebrate Biology
33. BIO 416 Vertebrate Biology
34. BIO 418 Mammalogy
35. BIO 421 Immunology
36. BIO 431 Molecular Biology
37. BIO 455 Entomology
38. CHE 111 General Chemistry
39. CHE 120 General Chemistry II
40. CHE 310 Organic Chemistry I
41. CHE 311 Organic Chemistry Laboratory I
42. CHE 312 Organic Chemistry II
43. CHE 313 Organic Chemistry Laboratory II
44. CHE 321 Quantitative Analysis
45. CHE 326 Instrumental Analysis
47. CHE 370 Biochemistry
48. CHE 381 Physical Chemistry I
49. CHE 383 Physical Chemistry II
50. CHE 426 Instrumental Methods
51. CHE 441 Advanced Inorganic Chemistry
52. CHE 470 Biochemistry II
PRE-COURSE GENERAL UNDERGRADUATE RESEARCH SKILLS ASSESSMENT

Using the following rating scale, circle the appropriate number for each statement that best fits your profile:

a. Strongly disagree
b. Somewhat disagree
c. Neutral/No opinion
d. Somewhat agree
e. Strongly agree

You may assume the availability of a basic non-programmable calculator in the following questions.

53. I can solve basic mathematical problems containing exponents and scientific notation.

54. I can identify the relative value of two numbers containing exponents

55. I can use logarithms and antilogarithms to solve problems related to calculating pH.

56. I can accurately identify the relative values of two numbers with units used in the metric system (i.e. cm, mm, nm, ml, and ul)

57. I can accurately perform unit conversions if given a conversion table.

58. I can determine the relationship between two quantities using ratios and proportions.

59. I can determine the relationship between multiple quantities using values related to percentages.

60. I can determine the density of a solution given the mass and volume.

61. I can effectively communicate the terminology associated with dilutions (i.e. differentiate between 1/10 vs. 1:9).

62. Given the equation for a line in the form of $y = mx + b$, I could accurately plot the line on a graph.

63. Given a set of data points, I could accurately determine the mean.

64. Given a set of data points, I could accurately determine the standard deviation.

65. I could accurately identify the control in a written experimental protocol.

66. I could describe and differentiate between a positive and negative control in a medical test.

67. I could accurately evaluate the meaning of a false positive versus a false negative in a medical test.

68. I could accurately determine the absolute error and percent error of a set of data compared to a provided standard.
69. I could accurately determine the correct number of significant digits in a number.
70. I could accurately round a given number to the nearest tenth decimal place.
71. I know the basic metric unit of measurement for mass.
72. I can properly and accurately maintain, calibrate and use a balance.
73. I can accurately determine the accuracy, precision and linearity of a balance.
74. I know the difference between accuracy and precision.
75. I know the difference between a standard operating procedure (SOP) and a protocol.
76. I know the basic metric unit of measurement for volume.
77. I can accurately identify and differentiate between the basic laboratory equipment used to measure volume.
78. I know the difference between glassware stamped with the letters TC vs. TD.
79. I know the difference between a Mohr pipette and a serological pipette.
80. I can properly use a micropipetter.
81. I can efficiently and accurately determine the accuracy and precision of a micropipettor.
82. I can identify and describe the difference between a partial immersion liquid thermometer and a total immersion thermometer.
83. I can properly and accurately maintain, calibrate and use a pH meter.
84. I could accurately identify the dependent and independent variable(s) in a controlled experiment.
85. I could accurately plot the dependent and independent variable(s) in a controlled experiment on a graph.
86. I can accurately blank and use a Spec 20 for determining the % transmittance of a solution.
87. I can accurately convert % transmittance to absorbance.
88. I can accurately make a solution of a specific volume based on weight/volume.
89. I can accurately make a solution of a specific volume based on molarity.
90. I can accurately make a solution of a specific volume based on percents.
91. I can accurately make a solution of a specific volume based on parts (ppm, ppb, etc).

92. I can accurately make a solution of a specific volume based on the dilution of stock solutions.

93. I can accurately make a solution of a specific volume and pH, based on molarity.

94. I can accurately differentiate between the filtrate and retentate in reference to using a filter.

95. I can accurately differentiate between adsorption and absorption in reference to using a filter.

96. I can accurately describe the differences between qualitative filter paper and quantitative filter paper.

97. I can accurately describe the process of dialysis.

98. I can accurately use dialysis membrane to desalt a solution.

99. I can properly and accurately maintain and use a refrigerated preparative centrifuge.

100. I can properly and accurately maintain use a microcentrifuge.

101. I can accurately determine relative centrifugal force (RCF) on a particle in a centrifuge.

102. I can accurately determine the revolution per minute (RPM) to use in a centrifuge if given the RCF value.

103. I can accurately describe the meaning of a sedimentation coefficient or S value as it relates to centrifugation.

104. I can differentiate between preparative centrifugation and analytical centrifugation.

105. I can accurately differentiate between a supernatant and pellet in a centrifuged sample.

106. I can properly and accurately handle, maintain and use a light microscope.

107. I can accurately determine the total magnification of a specimen using a specific set of ocular and objective lenses.

108. I can differentiate between magnification and resolution.

109. I can accurately determine the limit of resolution of an objective lens if given its numerical aperture.

110. I can accurately and efficiently calibrate and quantitatively use an ocular micrometer.

111. I can accurately and efficiently quantify the number of cells in a solution using a hemacytometer.
112. I can accurately generate a standard curve and determine the concentration of proteins in a cell homogenate sample.

113. I can accurately and efficiently determine the molecular weight and identity of a protein using SDS-PAGE and Western Blotting.

114. I can effectively use Microsoft Office Word

115. I can effectively use Microsoft Office PowerPoint

116. I can effectively use Microsoft Office Excel

117. I can effectively use statistical software such as SPSS.

118. I can effectively use the reference management software such as EndNote.

119. I can effectively communicate contemporary scientific research orally to my peers.

120. I can effectively communicate contemporary scientific research in writing to my peers.

121. I am knowledgeable about what a “primary research article” is and what its purpose is in the scientific world.

122. I can effectively read and comprehend a primary research article for myself.

123. I can effectively communicate findings of a primary research article to my science peers.

124. I can effectively communicate findings of a primary research article to my non-science peers.

125. I can effectively integrate and synthesize information from several related primary research articles.

126. I am knowledgeable on the state of current research in the field of cellular & molecular biology.

127. I am knowledgeable on how scientists communicate scientific information with each other and with the public.

128. I am interested in doing an undergraduate research project in a scientific field.

129. I am contemplating a future career that involves scientific research and/or health professions.

130. I have the skills to read primary research articles in scientific fields other than cell & molecular biology.
131. As part of my learning to do science and learning to think scientifically, it is important that I am familiar with primary scientific research and that I connect what I learn from understanding primary research to lecture and laboratory-based scientific instruction.

132. I have previously presented a primary research article in the form of a scientific research journal club.

133. I have previously written a paper intended for a non-scientist audience that communicated scientific discoveries from a primary research article.

134. I have previously reviewed a science topic by writing a research paper that required that I read and cite mostly primary research articles as my source literature.

135. I have previously given a formal oral presentation of scientific research that involved reviewing a specific topic.

136. I have previously written a report on a scientific investigation in the format of a primary research article intended for a peer-reviewed research journal.