

Course Name	General Biology I		
Semester, Year	First Semester, 2019	Number of Credits	2 credits
Course level	2000	Course Number	027017
Instructor(s) (Institution)	Maria Helena Fortunato Martins 大学院理学研究院		
Course Objectives	<p>Understand the scientific process; distinguish observation, hypothesis, test, and theory</p> <p>Recognize and know properties of the major classes of biological molecules</p> <p>Know the structure and function of cellular membranes and organelles</p> <p>Understand how cells harvest energy from chemical substances</p> <p>Understand how plants trap energy in light and use it to build biological molecules</p> <p>Know the stages of the cell cycle and its role in the life of organisms</p> <p>Recognize the stages of mitosis and meiosis</p> <p>Know the major features of meiosis and its role in the life cycle of organisms</p> <p>Know the biological costs and benefits of sexual reproduction</p> <p>Understand the structure and function of nucleic acids</p> <p>Understand the mechanics of protein synthesis</p> <p>Understand and be able to apply the principles of Mendelian genetics and its modern extensions</p> <p>Understand the chromosomal basis of heredity</p> <p>Understand the basic principles of population genetics</p> <p>Understand the basic principles of evolution</p> <p>Be familiar with the diversity, causes, and consequences of genetic mutations</p> <p>Have an appreciation for the promise and potential problems of biotechnology</p> <p>Understand Darwinian evolution and its modern extensions</p>		
Course Goals	<p>The course will present the fundamental principles and concepts of biology. The course will emphasize how the concepts were originally conceived and tested and how alternatives were rejected. Students will learn and use the fundamental concepts of biology to draw conclusions from data, to develop alternative hypotheses to explain observations, to make predictions, and to design experiments to test hypotheses. In addition, the social and medical implications of biological findings will be developed as classroom discussions</p>		
Course Schedule	<p>Week 1 The Science of Biology, Atoms and Molecules Ch.1 & 2</p> <p>Week 2 Chemical Building Blocks Ch. 3</p> <p>Week 3 Cell Structure (Prokaryotes and Eukaryotes) Ch. 4</p> <p>Week 4 Membranes and Transport Ch. 5</p> <p>Week 5 Energy, Enzymes, Metabolism Ch. 6</p> <p>Week 6 Cellular Harvest of Energy Ch. 7</p> <p>Week 7 Photosynthesis Ch. 8</p> <p>Week 8 Cell Division and Sexual Reproduction Ch. 10 & 11</p> <p>Week 9 Mendelian Genetics Ch. 12 & 13</p> <p>Week 10 DNA & the Genetic Material Ch. 14</p> <p>Week 11 How Genes Work, Expression and Control Ch. 15 & 16</p> <p>Week 12 Biotechnology and Genomics Ch. 17 & 18</p> <p>Week 13 Population Genetics, Evidence for Evolution Ch. 20 & 21</p> <p>Week 14 Origin of Species and Species Concepts Ch. 22 & 23</p> <p>Week 15 Comprehensive Final Exam</p>		
Homework	<p>Students will be given home work every week. Tasks will be related to the material given in class that day. Examples of tasks are: to compare (schematic) animal and plant cells; to compare (schematic) structure and function of Prokaryotes and Eukaryotes; bring an example of how biotechnology can help solve modern society problems; bring an example of evolution in action. They will also prepare 6 short research essays (about 3 pages long including figures and references) based in a series of topics given by the teacher.</p>		
Grading System	<p>Grades will be based on the numeric average of attendance (10%), homework + research (30%), short daily quizzes + mid term exam (35%) and final comprehensive exam (25%). Grades are based not on relative performance evaluation, but on absolute evaluation.</p>		
Textbooks / Reading List	<p>Biology (10th ed.) P. H. Raven, G. B. Johnson, J. B. Losos, K. A. Mason and S. R. Singer McGraw-Hill 2014</p>		
Websites	<p>http://highered.mheducation.com/sites/0073383074/student_view0/index.html</p>		
Website of Laboratory			
Additional Information			