INSTRUCTOR: Justin Williams  
Phone: (325) 669-2873  
Email: jcatwilliams@gmail.com

COURSE: BITC 1200 – Fundamentals of Biological Sciences

COURSE STRUCTURE AND CREDITS: 1 lecture hour, 2 lab hours – 2 semester hours

PREREQUISITES: None

COURSE DESCRIPTION: Skills and concepts necessary to work in the biotechnology industry, allied health, or other biology-related fields. Emphasizes applied mathematics, communication skills, and core science knowledge and applications.

LEARNING OUTCOMES: Identify career opportunities in the biological sciences; perform basic laboratory skills including pipetting, weighing, and preparing solutions; and apply mathematical problem solving and written and verbal communication skills in a laboratory setting.

REQUIRED TEXTBOOK/AND/or MATERIALS: Biotechnology: Applying the Genetic Revolution, Clark & Pazdernik  
1 laboratory notebook with carbon-less duplicate

EVALUATION METHODS/GRADING: Post-Lab Reports and Assignments 30%  
Quizzes 20%  
Tests and Final 50%  
100%

GRADING SYSTEM:  
90 - 100 = A  
80 - 89 = B  
70 - 79 = C  
60 - 69 = D  
BELOW 60 = F

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EXAMS: A total of three exams will be given. These exams will cover both material covered in lecture and in lab. The final will be cumulative. If an exam is missed, the make-up will be on the student's own time and must be made up prior to the next class meeting. If the test is not taken in the time frame allowed, a zero will be given on that specific exam.

POST-LAB REPORTS: A written report of laboratory work performed is due the following week of each lab. Guidelines will be provided. Due to the time involved in preparing and
working through each lab, a missed lab cannot be made up. However, one may still obtain the data from other lab group members, complete the post-lab, and turn it in for a maximum of a 70. The absence and the source of the data must be noted in the conclusion. Failure to do this will result in a zero for that lab. Missed labs must be turned in on time or will not be accepted. No lab grades will be dropped.

**QUIZZES:**

Short quizzes will be administered throughout the semester, preferably weekly. They will be announced a week prior and will cover the previous week’s material. Missed quizzes cannot be made up; however the three lowest quiz grades will be dropped.

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BITC 1200 Schedule: Monday 6:00-10:00 PM
(Subject to minor revision)

August 25  Lecture – Introduction, Pretest
           Lab – No lab

September 1 Lecture – Intro to Cellular Biology
            Lab – Cell Structures and Function

September 8: Lecture – Biotech Basics
             Lab – Introduction to Microscopy Part I

September 15 Lecture – Central Dogma of Molecular Biology
             Lab – Introduction to Microscopy Part II

September 22: Lecture – DNA
             Lab – Microscopic Measurements

September 29: Lecture – Genetics
             Lab – Effect of Environment on a Protein

October 6   Lecture – Laboratory Math Part I
             Lab – Genetics of Bitter Taste

October 13: Lecture – Test I
             Lab – No Lab

October 20: Lecture – Laboratory Math Part II
             Lab – TBA

October 27: No Lab or Lecture. I'm in Chicago for a class.

November 3 Lecture – Environmental Biotechnology
               Lab – TBA

November 10 Lecture – Biological Warfare
               Lab – TBA

November 17 Lecture – Test II
               Lab – No Lab

November 24: Lecture – Forensic Biotechnology
             Lab – TBA

December 1  Lecture – Review for Final Exam
             Lab – Review for Final Exam

December 8  Final Exam
CISCO COLLEGE
Syllabus - Fall 2015

INSTRUCTOR: Justin Williams
Phone: (325) 669-2873
Email: jcatwilliams@gmail.com

COURSE: BITC 1311 – Introduction to Biotechnology

COURSE STRUCTURE AND CREDITS: 3 hr Lecture

PREREQUISITES: None

COURSE DESCRIPTION: An introduction to biotechnology including career exploration, history and applications of DNA/RNA technology, molecular biology, bioethics, and laboratory safety practices.


EVALUATION METHODS/GRADING

<table>
<thead>
<tr>
<th>Evaluation Method</th>
<th>Weight</th>
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<tbody>
<tr>
<td>4 Lecture tests</td>
<td>50%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>25%</td>
</tr>
<tr>
<td>Short Quizzes</td>
<td>15%</td>
</tr>
<tr>
<td>Presentation</td>
<td>10%</td>
</tr>
</tbody>
</table>

100%

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90 - 100 = A
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EXAMS: A total of four exams will be given which will test the student's knowledge over reviewed chapters. At the end of the semester a final comprehensive exam will be given.

MISSED EXAMS: If an exam is missed, the make-up will be on the student’s own time and must be made up prior to the next class meeting. If the test is not taken in the time frame allowed, a zero will be given on that specific exam. No make-ups will be provided for final exams.

POST-LAB REPORTS: A written report of your laboratory work is due at the end of each lab following the completion of the work. Guidelines for this report will be provided.

QUIZZES: There will be short quizzes given throughout the semester. They will be administered at the beginning of the class. A missed quiz will result in a zero. The lowest quiz grade will be dropped for the final grade.

PRESENTATION: There will be a presentation at the end of the semester. Students are required to do research on their own time and prepare a PowerPoint presentation.

PARTICIPATION: Participation in class discussion is essential for the learning experience of all. We learn from listening to others expressing their opinions and from the expression of our own opinions.

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**Schedule: Introduction to Biotechnology**

**Fall 2014**

**Tuesday: 5:30-8:30/9:00**

<table>
<thead>
<tr>
<th>Date</th>
<th>Chapter:</th>
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<tbody>
<tr>
<td>8/24</td>
<td>Introduction; Ch. 1 (Biotechnology and the Workforce)</td>
</tr>
<tr>
<td>8/31</td>
<td>Ch. 2 (Introduction to Genes and Genomes)</td>
</tr>
<tr>
<td>9/7</td>
<td>HOLIDAY</td>
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<tr>
<td>9/14</td>
<td>Ch. 3 (Recombinant DNA Technology and Genomics)</td>
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<tr>
<td>9/21</td>
<td>Exam 1</td>
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<tr>
<td>9/28</td>
<td>Ch. 4 (Proteins)</td>
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<tr>
<td>10/5</td>
<td>Ch. 5 (Microbial Technology)</td>
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<td></td>
<td>Tests:</td>
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<td></td>
<td>Exam 2</td>
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</tbody>
</table>
10/12  Ch. 6 (Plant Biotechnology)
10/19  Ch. 7 (Animal Biotechnology)
10/26  Exam 3
11/2   Ch. 8 (DNA Fingerprinting & Forensics)
11/9   Ch. 9 (Bioremediation)
11/16  Ch. 10 (Aquatic Biotechnology)
11/23  Exam 4
11/30  Presentations
12/7   Final
INSTRUCTOR: Justin Williams  
Phone: (325) 669-2873  
Email: jcatwilliams@gmail.com

COURSE: BITC 1402 – Biotechnology Lab Methods and Techniques

COURSE STRUCTURE AND CREDITS: 3 lecture hours, 3 lab hours – 4 semester hours

PREREQUISITES: None

COURSE DESCRIPTION: Laboratory operations, management, equipment, instrumentation, quality control techniques, and safety procedures. Includes laboratory practice in using pH meters, mixing buffers, performing measurements, preparing solutions, and performing separatory techniques.

LEARNING OUTCOMES: Prepare solutions and reagents to specifications; demonstrate laboratory calculations; use a variety of laboratory instruments including pH meters, and spectrophotometers; perform separatory techniques to specifications; and demonstrate appropriate laboratory safety and management.

REQUIRED TEXTBOOK/AND/OR MATERIALS: Basic Laboratory Methods for Biotechnology, Siedman & Moore, 2nd edition
1 laboratory notebook with carbon-less duplicate

EVALUATION METHODS/GRADING:
- Post-Lab Reports and Assignments 50%
- Quizzes 15%
- Tests and Final 35%

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lab. Guidelines will be provided. Due to the time involved in preparing and working through each lab, a missed lab cannot be made up. However, one may still obtain the data from other lab group members, complete the post-lab, and turn it in for a maximum of a 70. The absence and the source of the data must be noted in the conclusion. Failure to do this will result in a zero for that lab. Missed labs must be turned in on time or will not be accepted. No lab grades will be dropped.

**QUIZZES:**
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August 24  Online – nothing  
Lab – Introduction, Pre-test, Lab 1: Common lab elements  

August 31  Online - Nothing  

September 7  Online – Intro to biotech (Ch.2 section I & III), Measurements and Weight (Ch.17 & 19) 
Lab – Lab 2: Weight/Mass  

September 14  Online – Volume and Temperature (Ch.20 & 21) 
Lab – Lab 3: Volume Part 1  

September 21  Online – ISE and QC (Ch. 22 & 24)  
Lab – Lab 4: Volume Part 2  

September 28  Online – Laboratory Solutions (Ch. 26 & 27)  
Lab – Lab 5: Solutions Part 1  

October 5  Online – nothing  
Lab – Test 1 (will cover lecture material and lab material)  

October 12  Online – Water and labware (Ch. 28) and Intro to quality (ch.4)  
Lab – Lab 6: Solutions Part 2  

October 19  Online – Regulation and Documentation (Ch. 5 and 6)  
Lab – Lab 7: pH measurements  

October 26  Nothing online or lab; I'm in Chicago for a class  

November 2  Online – Quality systems (Ch. 7 and 8)  
Lab – Lab 8: Acids, Bases, and Titrations oh my  

November 9  Online – Safety Part 1 (Ch. 9 and 10)  
Lab – Lab 9: Buffers!!! Everyone's best friend.  

November 16  Online – Safety Part 2 (Ch. 11 and 12)  
Lab – Lab 10: Separations  

November 23  Online  

December 30:  Online – Comprehensive lecture final  
Lab – Test 2 (will cover lecture material and lab material)  

December 7  Online – nothing  
Lab – FINAL (comprehensive lab practical)
INSTRUCTOR: Justin Williams  
Phone: (325) 669-2873  
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COURSE: BITC 2431 – Cell Culture Techniques

COURSE STRUCTURE AND CREDITS: 3 lecture hours, 3 lab hours – 4 semester hours

PREREQUISITES: None

COURSE DESCRIPTION: Theory and applications of cell culture techniques. Laboratory emphasis on the principles and practices of initiation, cultivation, maintenance, preservation of cell lines and applications.

LEARNING OUTCOMES: Demonstrate aseptic cell culture technique; demonstrate cell culture skills including harvesting, counting, and subculturing of cell lines, multiwell culture, selected cell culture based assays and basic cell preservation procedures; and demonstrate appropriate laboratory safety and management.

REQUIRED TEXTBOOK/AND/OR MATERIALS: 

1 laboratory notebook with carbon-less duplicate

EVALUATION METHODS/GRADING:

- Post-Lab Reports and Assignments: 50%
- Quizzes: 15%
- Tests and Final: 35%

100%

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<table>
<thead>
<tr>
<th>Date</th>
<th>Lecture Topic</th>
<th>Lab Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>August 27</td>
<td>Lecture – Introduction, Pretest</td>
<td>Lab – No laboratory</td>
</tr>
<tr>
<td>September 3</td>
<td>Lecture – Cell culture, biology, lab design and equipment (ch. 1-4)</td>
<td>Lab – Aseptic Techniques</td>
</tr>
<tr>
<td>September 10</td>
<td>Lecture – Continue previous and start aseptic technique (ch.5)</td>
<td>Lab – Thawing Cells and Preparing Medium</td>
</tr>
<tr>
<td>September 17</td>
<td>Lecture – Safety, validation, and culture vessels (ch.6, 7)</td>
<td>Lab – Observation of Cultured Cells</td>
</tr>
<tr>
<td>September 24</td>
<td>Lecture – Media (ch.8, 9)...no movies unfortunately</td>
<td>Lab – Feeding a Monolayer Culture</td>
</tr>
<tr>
<td>October 1</td>
<td>Lecture – Preparation and primary culture (ch.10, 11)</td>
<td>Lab – Counting Cells</td>
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<tr>
<td>October 8</td>
<td>Lecture – Secondary cultures and cloning (ch.12,13)</td>
<td>Lab - Subculture</td>
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<td>October 15</td>
<td>Lecture – Cell separation and characterization (ch.14, 15)</td>
<td>Lab – Cell Staining</td>
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<tr>
<td>October 22</td>
<td>Test I</td>
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<td>October 29</td>
<td>TBA</td>
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<tr>
<td>November 5</td>
<td>Lecture – Immortilization, Contamination, preservation (ch.17,18,19)</td>
<td>Lab – Growth Curves</td>
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<td>November 12</td>
<td>Lecture – Quantitation and cytotoxicity (ch.20,21)</td>
<td>Lab - Cryopreservation</td>
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<tr>
<td>November 19</td>
<td>Test II (I know I'm mean :)</td>
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<tr>
<td>November 26</td>
<td>HAPPY THANKSGIVING!!</td>
<td></td>
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<tr>
<td>December 3</td>
<td>Final Review (the end is near!)</td>
<td></td>
</tr>
<tr>
<td>December 10</td>
<td>Final</td>
<td></td>
</tr>
</tbody>
</table>
INSTRUCTOR: Justin Williams  
Phone: (325) 669-2873  
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COURSE: SCIT 1414.50 – Applied Chemistry

COURSE STRUCTURE AND CREDITS:  
2 hr Lecture  
4 hr Lab  
Total of 4 semester hours

PREREQUISITES: None

COURSE DESCRIPTION: Applications of general chemistry emphasizing industry-related laboratory skills and competencies including laboratory safety and report writing. Addresses supporting chemical theories including atomic and molecular structure, nomenclature, chemical reactivity, gas laws, acids and bases, and solutions.

LEARNING OUTCOMES: Demonstrate industry-related laboratory skills including measuring physical and chemical properties of matter, performing chemical calculations, naming and writing chemical formulas, writing equations for chemical reactions, and demonstrating stoichiometric relationships; describe basic atomic and molecular structure; write laboratory reports; and apply safe laboratory practices.

REQUIRED TEXTBOOK/AND/OR MATERIALS:  
Tenth Edition Chemistry by Whitten, Davis, Peck, Stanley

EVALUATION METHODS/GRADING  
3 Lecture tests – 2 chapter/1FINAL = 50%  
Post-Lab Reports/Homework = 10%  
2 Lab Tests – Midterm/FINAL = 20%  
Short Quizzes = 20%  
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EXAMS: A total of five (5) exams will be given. Three in class exam which will test the student’s knowledge over reviewed chapters. Two laboratory exams which will test the student’s skill level within the laboratory.

MISS EXAMS: If an exam is missed, the make-up will be on the student’s own time and must be made up prior to the next class meeting. If the test is not taken in the time frame allowed, a zero will be given on that specific exam. No make-ups will be provided for final exams.

POST-LAB REPORTS: A written report of your laboratory work is due at the end of each lab following the completion of the work. Guidelines for this report will be provided.

QUIZZES: There will be short quizzes given throughout the semester. The lowest quiz grade will be dropped for the final grade.
PARTICIPATION: Participation in class discussion is essential for the learning experience of all. We learn from listening to others expressing their opinions and from the expression of our own opinions.

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Students with Special Needs Students who qualify for specific accommodations under the Americans with Disabilities Act (ADA) should notify the instructor the first week of class. It is the student’s responsibility to provide the necessary documentation to the Special Populations Coordinator.

Student Conduct Students are expected to take responsibility in helping to maintain a classroom environment that is conducive to learning. In order to assure that all students have the opportunity to gain from the time spent in class, students are prohibited from using cell phones or beepers, making offensive remarks, reading material not related to the class, sleeping, or engaging in any other form of distraction. Inappropriate behavior in the classroom shall result, at a minimum, in a request to leave class. A more detailed list of inappropriate behaviors is found in the current student handbook.

Student Technology Use in Classroom Policy Use of communication devices, including not limited to cell phones, pagers, and palm devices is prohibited during class. Laptops may be be used for note-taking or composing only. Any exception to this policy may be granted at the discretion of the instructor. Use of any communication device or data storage device during a test, unless express permission has been granted by the instructor, may result in a charge of academic dishonesty. An exception to this policy may occur due to college-wide emergency notification.
<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
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<tbody>
<tr>
<td>8/26</td>
<td>Introduction; Ch. 1 (Fundamentals of Chemistry)</td>
</tr>
<tr>
<td>9/3</td>
<td>Ch. 2 (Chemical Formulas/Composition Stoichiometry)</td>
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<td></td>
<td>Lab: Significant Figures</td>
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<td>9/10</td>
<td>Finish Ch. 2/ Start Ch. 3 (Chemical Equations/Reaction Stoichiometry)</td>
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<td>Lab: Statistics Practice</td>
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<tr>
<td>9/17</td>
<td>Finish Ch. 3; Lab: Extraction Methods</td>
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<td>9/24</td>
<td>Exam 1</td>
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<td>10/1</td>
<td>Ch. 4 (Structure of Atoms); Lab: Density</td>
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<td>10/8</td>
<td>Lab Midterm</td>
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<td>10/15</td>
<td>Ch. 5 (Chemical Periodicity); Lab: Endothermic Reactions</td>
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<td>10/22</td>
<td>Finish Ch. 5; Lab: Exothermic Reactions</td>
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<td>10/29</td>
<td>Ch. 6 (Types of Chemical Reactions); Lab: Chromatography</td>
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<td>11/5</td>
<td>Finish Ch. 6; Lab: Spectrophotometry</td>
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<td>11/12</td>
<td>Exam 2</td>
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<td>11/19</td>
<td>Lab: Titration</td>
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<td>11/26</td>
<td>THANKSGIVING BREAK</td>
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<td>12/3</td>
<td>Lab Final</td>
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<tr>
<td>12/10</td>
<td>Final</td>
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