**BIO-2120-VO05 - Elements of Microbiology – Online - Revised 5-12-2021**

**Location:** Online
**Credits:** 4
**Day/Times:** Weekly online: Tuesday 12:00 am to Monday at 11:59 pm.
**Semester Dates:** 5-25-2021 to 8-16-2021
**Faculty:** Joseph Dionne, DC

**Course Description:**

This course provides a comprehensive study of the basic principles of microbiology. A brief survey of the history of science is given. Emphasis is placed on understanding the variety and differences of microbes and their relationship to humans. Laboratory study accompanies the course and the successful completion of lab exercises is a partial requirement for the course. Prior learning in Basic Chemistry Workshop or biology equivalent is strongly recommended. Prerequisite: Basic Algebra.

**Essential Objectives:**

1. Compare the theoretical aspects of historical development in the field of microbiology to current concepts of microbiology.
2. Identify macroscopic and microscopic morphology of common microbial isolates.
3. Apply the theoretical and practical aspects of physical and chemical methods used to control microorganisms.
4. Explain the relationships that can exist between host and microorganism.
5. Discuss the disease process as it relates to common microbial pathologies.
6. Model and explain the theoretical and practical aspects of culturing and staining bacteria.
7. Demonstrate proficiency in understanding, interpreting, evaluating, and applying quantitative data and information.
**Lab Objectives:**1. Apply knowledge of the scientific method to construct hypotheses, predictions, and lab reports and to design, analyze, and/or critique experiments found throughout peer-reviewed research and laboratory notebooks.
2. Utilize mathematical techniques necessary to properly collect and interpret data (i.e., unit conversions, standardization, and scaling necessary for data collection, graphing and charting).
3. Apply proper techniques in using common scientific tools to collect data and describe how they work (i.e., microscopes, spectrophotometers, UV sterilizers, etc.).
4. Identify and demonstrate lab safety techniques that are in line with CCV’s Chemical Hygiene Plan, Lab Safety Agreements, and chemical Safety Data Sheets (SDS).

**Additional Instructor Pre-Assignments/Notes/Comments:**

 Please read the recommended chapters prior to posting in the discussion forum each week as this will allow you to be better prepared for online class discussion and learning. Please view all available PowerPoint slides and their embedded audio of me lecturing (you will need to download to play audio and view the notes under the slides in PowerPoint).

I am always available via CCV e-mail. I check this several times per day, including the weekend. I make every effort to respond to e-mails within 24 hours. All messages will be sent to your CCV (or VSC) e-mail account for security purposes.

**Methods:**

Lecture/ Online Resources
Laboratory Sessions (Virtual)
Laboratory Reports
Online Class Discussion
Videos
 Article Reviews/Case Studies

**Evaluation Criteria:**

Lecture Exams (6): 50% of final grade (lowest grade dropped)

Quizzes (6): 10% of final grade (lowest grade dropped)

Attendance/Online

Discussion/Assignments: 15% of final grade

Lab Reports (2): 8% of final grade\*

Lab Article Review: 2% of final grade\*

Lab Work/ Lab Quizzes: 15% of final grade\*

(\*Please note: The lecture component of this course comprises 75% of your overall score, while Lab Activities/Assignments comprise 25% of your overall score)

**Late Policy:** Please note, assignments will **not** be accepted late\*\*. I will make a one-time offer (a free pass) that may be used for only one of the following: lab report, article review, or weekly homework assignment to be turned in up to one week late without penalty. However, if you turn all of the term’s assignments in on time and do not use your “free pass”, I will add 5 points to your second lowest exam score for this course at the end of the term. This offer is all-or-none. Make-up exams and quizzes will **NOT** be provided under any circumstances\*\*. The lowest exam and quiz grade at the end of the term will be dropped. Lab Assignments cannot be dropped or made-up under any circumstances\*\*. Exams, quizzes, lab activities and forum discussions do not qualify for the “free pass” program.

\*\*Exceptions will be made for extenuating circumstances only, such as student illness (i.e. COVID-19, cancer treatment, etc.) or natural disaster (i.e. storm damage with loss of power for several days). Documents may be requested at the instructor’s discretion.

All written assignments must be typed and turned in by the day they are due via the online assignment box on Canvas. Assignments will only be posted using Microsoft Office Products as CCV provides these on all computers on campus and low cost to all students. If you do not have Microsoft office on your personal computer, you will need to download it or make time to use the computers on campus (when possible) to complete assignments in this course. Assignments must be turned in using Microsoft Office products, in a PDF, in a RTF, using Google Documents, or copy and paste into the drop box. I do not have access to a Mac and am unable to accept assignments using Mac products. **It is recommended that you use Chrome, Firefox, or Edge as your browser**. Please do **NOT** use Safari or other browsers made for cell phones/tablets as they have been known to block certain parts of the quizzes/exams.

**Lecture Exams:**

*Description*: Exams will have a mixture of Multiple Choice, True/False, and Short Answers. Any cumulative material will be discussed in advance (which is a rare occurrence). Concepts learned during lab activities may be assessed during lecture exams. All six lecture exams will be given online using Canvas. All lecture exams will be 90 minutes in length and consist of 45 questions each. The lowest lecture exam score of the term will be dropped at the last day of this course. **Exams will only be available from Tuesday at 12:00 am to Monday at 11:59 pm the week of the exam** (for security purposes). You will have one attempt per exam, and they cannot be made up. Exams are closed notes and you are not allowed to use your notes or websites while taking the exam. Please plan accordingly.

*Purpose*: The exams in this course are timed for security purposes and to provide you with practice taking timed, closed-notes exams. Many of you plan on continuing your education with a 4-year STEM degree or a nursing/healthcare degree, and the standard for these programs is the timed, closed-notes exam. Thus, this course seeks to prepare you for such assessments. Lecture exams provide you the opportunity to display strong critical thinking skills throughout the term. There are 6 exams so that the amount of material on any one exam is not more than the others.

**Quizzes:**

*Description*: Quizzes are not cumulative. Quizzes will have a mixture of Multiple Choice, True/False, and Short Answers. Quizzes cannot be made up under any circumstance. Quizzes will always be administered online through Canvas. All quizzes will be 20 minutes in length and compose of 10 questions each. The lowest quiz grade will be dropped at the end of the term. **Quizzes will only be available from Tuesday at 12:00 am to Monday at 11:59 pm the week of the quiz** (for security purposes). You will have one attempt per quiz, and they cannot be made up. Quizzes are closed notes and you are not allowed to use your notes or websites while taking the quiz. Please plan accordingly.

*Purpose*: Past students recommended providing a quiz on non-exam weeks to assist in guiding the study of the substantial content covered in this course. Quizzes serve as a gauge of your understanding as you prepare for each unit lecture exam. Quizzes also provide practice in answering timed questions on Canvas prior to taking each unit exam.

**Attendance/ Online Assignments:**

*Description*: More information to follow on the weeks when each activity is due. These will be completed virtually via Canvas. All online assignments, quizzes and exams must be completed by the due date (11:59 pm on Monday). Online participation is NOT optional and failure to complete a week’s online activities will result in an absence and loss of respective points. The lab portion and lecture aspect of this course will run from Tuesday at 12:00 am to 11:59 pm. Be certain to track assignment due dates through the schedule and the course Canvas page.

*Purpose*: To assist you in investigating the module’s contents each week. Much of the content discussed in the homework assignments will be revisited in quizzes and exams.

**Discussion Forums:**

*Description*: You will participate in weekly discussion forums. All discussion forums requiring you to respond to other students’ posts must be completed by the following days and times each week: Post your response to the discussion prompts by 11:59 pm Thursday and reply to a minimum of two other students by 11:59 pm Monday each week. Please note, Canvas only allows one due date, so only the Sunday due date will populate in the To Do List each week but please do not forget about posting your initial response by Thursday at 11:59 pm. All prompts must be completed on time to earn full credit. The following is the breakdown of points to be earned for each weekly **discussion forum**:

* **Initial response** posted by **Thursday at 11:59 pm** with all prompts covered completely (3 points)
	+ If posted after Thursday 11:59 pm subtract 1 point
	+ If post is missing key prompt information, subtract 1 point
* **Two replies** to fellow students posted by **Monday at 11:59 pm** with all prompts covered completely (2 points)
	+ Subtract 1 point if a reply is not present or is missing key aspects of the prompt

= 5 points total each week

*Purpose*: The weekly discussion forums provide an opportunity to use creative thinking skills to communicate with other members of the class. These are also opportunities to enhance your research and writing abilities.

**Lab Reports:**

*Description:*Scientific writing is paramount to sharing ideas and discoveries to other scientists. We will follow the standardized lab report rubric recently produced by the Science and Allied Health Curriculum Committee at CCV. This format must be followed for full credit and all must be typed. No late assignments will be accepted. More information to be provided within the Canvas course.

*Purpose*: Crafting lab reports is an effective way of analyzing the data collected from our virtual simulation labs. This gives us insight into the scientific process and expands our writing skills.

**Lab Article Review:**

*Description*: You will locate a peer-reviewed journal article through the Hartness Library online search engine about a topic of interest to you that relates to the field of Microbiology. You will then complete the assignment provided in Canvas as part of your Lab grade for this course.

*Purpose*: To expand our skills retrieving and evaluating the scientific process and conclusions from scientists in the field of Microbiology. This will provide an opportunity to use critical thinking in regards to actual experiments and research.

**Lab Work/ Lab Quizzes:**

*Description:* Most weeks will have virtual lab simulations and activities to complete via the McGraw-Hill Virtual Labs. You will need to purchase your access codes through the bookstore. All lab activities must be completed by the due date as the labs close and lock up after the due date each week.

*Purpose:* This allows us to develop our lab skills via remote tools. We will expand our understanding of the scientific process and use critical thinking skills each week.

**Chemistry and Math for Microbiology Workshop:**

*Description*: This online required workshop must be completed by every student by the due date. Each student must earn a 100% on their last attempt of the quiz to move forward in the course. The quiz is timed but may be taken as many times as required to earn a 100%. This workshop is part of participation points online. Those with a strong chemistry and/or mathematics background will require less time to complete this workshop. **Please note:** This workshop quiz is very different than the remaining quizzes and exams in this course!

*Purpose*: You all have varying backgrounds in math and chemistry and this workshop ensures everyone is prepared for the few calculations and the chemical components of this course.

**Online Etiquette:**

Please note, that our online environment is a safe learning space for all. Disrespectful behavior of any kind will not be tolerated. A warning may be issued for the first offense and academic action with administration will occur for any subsequent infractions.

Please give references whenever necessary. Always place answers in your own words. Never copy and paste from online sources, the text, the lecture notes or other students. Submit your own work only. Failing to do so is considered an infraction against the academic honor code of CCV and will involve administrative action with the Dean. I ask that you provide the same respect and professionalism online as you would in traditional classroom settings.

**Grading Criteria:**

 **Sample Letter Grade Criteria**

Sample Letter Grade Criteria are listed below. Letter grade criteria are usually presented with the letter grade and the definition of what constitutes that grade either in text or a numerical equivalent. Instructors may also want to include an attendance policy here as part of their grading criteria. Add letter grade criteria one at a time to the Add Letter Grade Criteria form. Letter Grade Criteria will be formatted and displayed after each submission.

**A+ through A-**: For any work to receive an "A," it must clearly be exceptional or outstanding work. It must demonstrate keen insight and original thinking. It must not only demonstrate full understanding of the topic or issues addressed, but it must also provide a critical analysis of these. In addition, an "A" grade reflects a student's ability to clearly and thoughtfully articulate his or her learning.

**B+ through B-**: For any work to receive a "B," it must be good to excellent work. It must demonstrate strong originality, comprehension, critical thinking, and attention to detail. In addition, a "B" grade reflects a student's ability to clearly articulate his or her learning.

**C+ through C-**: For any work to receive a "C," it must meet the expectations of the assignment. It must demonstrate solid comprehension, critical thinking, and attention to detail. In addition, a "C" grade reflects a student's ability to adequately articulate his or her learning.

**D+ through D-**: For any work to receive a "D," it must marginally meet the expectations of the assignment. It demonstrates minimal comprehension, critical thinking, and attention to detail. In addition, a "D" grade may reflect a student's difficulty in articulating his or her learning.

**F**: Work that receives an "F" grade does not meet the expectations or objectives of the assignment. It demonstrates consistent problems with comprehension, organization, critical thinking, and supporting details. In addition, an "F" grade reflects a student's inability to articulate his or her learning. Students are strongly urged to discuss this grade with their instructor and advisor.

**The following numerical percentages will be used to calculate final course grades:**

**A+ = 97-100%
A  = 93-96%
A- = 90-92%
B+ = 87-89%
B   = 83-86%
B- = 80-82%
C+ = 77-79%
C   = 73-76%
C-  = 70-72%
D+  = 67-69%
D    = 63-66%
D-  = 60-62%
F   = below 60%**

**-PLEASE NOTE: I do not round up for final scores. For example, to earn a B, you must earn a minimum of 83.0%. An 82.9% is a B-. Thank you for your understanding.**

**Textbooks:**

**Microbiology.** Published through Rice University online. Text may also be purchased as a hard copy through Amazon or the bookstore. Kindle and iBooks downloads are also available for a nominal fee. Information can be found at <https://openstax.org/details/books/microbiology>.

**Virtual Lab:** We will have weekly lab assignments to complete virtually through McGraw-Hill. You will purchase your access code through the bookstore.

**Attendance Policy:**

 Regular attendance and participation in classes are essential components of a student's success in college and are completion requirements for courses at CCV. Each student will be allowed two (2) absences from online class without penalty (other than loss of assignment and attendance/participation points). A third (3rd) absence will result in a reduction of your final grade by one full letter grade ("A" becomes "B", "A-" becomes "B-" and so on). Please be aware that more than three (3) absences for any reason will result in a grade of "F".  Due to the nature and structure of this course, no differentiation will be made between unexcused/excused absences\*\*.

Any missed online activities, discussions, etc. will result in a zero for that assignment with no possibility to make up.

\*\*Exceptions will be made for extenuating circumstances only, such as student illness (i.e. COVID-19, cancer treatment, etc.) or natural disaster (i.e. storm damage with loss of power for several days). Documents may be requested at the instructor’s discretion.

**Faculty Contact Information:**

**Email Address:** Joseph.Dionne@ccv.edu

***Please note:*** *In order to receive accommodations for disabilities in this course, students must make an appointment to see the Americans with Disabilities Coordinator at their nearest CCV campus and ensure that the necessary documents are provided to the instructor at the start of the term. Any accommodations provided to the instructor after the start of the term will not be retroactive for previously due assignments.*

**Academic Honesty:** CCV has a commitment to honesty and excellence in academic work and expects the same from all students. Academic dishonesty, or cheating, can occur whenever you present -as your own work- something that you did not do. You can also be guilty of cheating if you help someone else cheat. Being unaware of what constitutes academic dishonesty (such as knowing what plagiarism is) does not absolve a student of the responsibility to be honest in his/her academic work. Academic dishonesty is taken very seriously and may lead to dismissal from the College.

Please note, that the instructor will not accept assignments that were also submitted in any other academic course at CCV, or other institution. The instructor reserves the right to analyze any assignments through Turnitin or another plagiarism prevention program without notice.

Additionally, all forum posts, quiz and exam answers must be in your own words. Cutting and pasting from online sources, the text, the notes, etc. is not acceptable. If you gather information and/or supply photos in the forum you discovered online, please provide citations at the end of your post.

**Schedule for Microbiology Online Summer 2021**

**Week One (5-25-2021 to 5-31-2021)\***

*Introduction to the Microbial World/ Chemical Principles*

Reading: Ch. 1, App. A, and Ch. 7

Lab: Virtual Lab Tour/Lab Safety

**Week Two (6-1-2021 to 6-7-2021)\***

*Chemical Principles Continued*/ *Microscopy*

Reading: App. A, Ch.7, and Ch. 2

Labs: Scientific Method/Aseptic Technique Parts A and B

Quiz 1 (Ch. 1,7, App.A)

Online Chemistry/Math Workshop Quiz due this week

**Week Three (6-8-2021 to 6-14-2021)\***

*Anatomy of Prokaryotes and Eukaryotes*

Reading: Ch. 3

Labs: Microscopy Parts A, B and C

Exam I (Ch. 1,2,7, app. A)

**Week Four (6-15-2021 to 6-21-2021)\***

*Microbial Metabolism*

Reading: Ch. 8

Lab: Staining Slide Prep/ Gram Stain Lab

Quiz 2 (Ch. 3)

**Week Five (6-22-2021 to 6-28-2021)\***

*Microbial Growth/Control of Growth*

Reading: Ch. 9, 13, and 14

Labs: How Enzymes Function Parts A and B/Cellular Respiration Parts A and B

Exam II (Ch. 3&8)

**Week Six (6-29-2021 to 7-5-2021)\***

*Microbial Genetics*

Reading: Ch. 10 and 11

Labs: Microbial Growth: Oxygen Requirements, pH, and Temperature

Quiz 3 (Ch. 9,13,14)

Lab Report #1 due this week

**Week Seven (7-6-2021 to 7-12-2021)\***

*Biotechnology and DNA Technology*

Reading: Ch. 12

Lab: Mendelian Genetics/Natural Selection

Exam III (Ch. 9,10,11,13,14)

**Week Eight (7-13-2021 to 7-19-2021)\***

*Classification/Bacteria and Archaea*

Reading: Ch. 4

Labs: Gel Electrophoresis

Quiz 4 (Ch.12)

**Week Nine (7-20-2021 to 7-26-2021)\***

*Fungi, Algae, Protozoa and Helminths*

Reading: Ch. 5

Labs: Research Lecture

Exam IV (Ch. 4&12)

**Week Ten (7-27-2021 to 8-2-2021)\***

*Viruses, Viroids, and Prions/Diseases and Epidemiology*

Reading: Ch. 6 and 16

Lab: Unknown Bacteria

Quiz 5 (Ch.5)

**Week Eleven (8-3-2021 to 8-9-2021)\***

*Mechanisms of Pathogenicity/ Innate Immunity*

Reading: Ch. 15 and 17

Labs: Read Article(s)

Article Review due this week

Exam V (Ch. 5,6,16)

**Week Twelve (8-10-2021 to 8-16-2021)\***

*Adaptive Immunity*

Reading: Ch. 18

Labs: Study for Quiz 6 and Exam 6

Lab Report #2 due this week

Quiz 6 (Ch. 15 and 17)

Exam VI (Ch. 15, 17, 18)

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| **\*Each week also has one discussion forum** |
| **and one homework assignment to complete** |
| **which are not reflected here. Please see the Canvas page for details.** |
| **Every week begins at 12am on Tuesday and ends at 11:59pm the nearest Monday.** |
| **Please also note that all exams and quizzes are online, timed and NOT open book.** |
| **All assignments, labs, exams and quizzes are due are on the Monday of that week at 11:59pm.** |
| **Please note the term ends on August 16, 2021 at 11:59 pm and no assignments can be accepted after that time.** |

***\*\*\*This syllabus and schedule are subject to change with notice from the instructor.***