MICROBIOLOGY with LAB

Spring 2020 | BIO 204-602 | NATURAL SCIENCES

Course Information

Credits: 4 credits
Pre/Co-requisites: BIO 111 or comparable general biology course strongly recommended
Meetings/Times: online as of March 30, 2020; (original: Tuesdays and Thursdays 12:00-2:40pm)
Location: SP125 (Sunlight Peak)
Department Assistant: David Bova; david.bova@frontrange.edu; SP224; (970) 204-8148
Microbiology Faculty Contact: Heidi Smith; heidi.smith@frontrange.edu; SP222; (970) 204-8148
College Website: www.frontrange.edu

Instructor Information

Instructor: Kristopher Parker
Email: kristopher.parker@frontrange.edu
Voicemail: (970) 267-2389

Course Materials

1. **REQUIRED:** CONNECT for Microbiology: A Systems Approach (5th Ed.) by Cowan
   - IMPORTANT NOTE: Your textbook materials are part of FRCC's inclusive access program, which means you are getting the lowest price of the materials automatically added to your course fees. Registration and access to these materials is obtained through a direct D2L link to the CONNECT system.
2. **REQUIRED:** Access to the CONNECT course with labs
   - LINK: https://connect.mheducation.com/class/k-parker-spring-2020-microbiology-labs
   - CODE: YF29-353B-ELUJ-RMK5-TYAA
   - Phone number for McGraw-Hill CONNECT Help Center: (800) 331-5094
3. **Optional:** You can purchase a print copy of the textbook. Loose-leaf three-hole punched versions are available in the bookstore or directly through the CONNECT website once you are registered.

Important Dates

First Day of Class: **January 21, 2020**
Attendance Deadline: **January 26, 2020**
Last Day to Drop with refund (and no W recorded): **February 5, 2020**
Payment Deadline: **February 25, 2020 (6pm)**
Spring Beak: **March 16, 2020 to March 29, 2020**
Courses transition to virtual: **March 30, 2020**
Graduation Application Deadline: **April 1, 2020**
Last Day to Withdraw (W recorded and no refund): **April 18, 2020**
Last Day of Class (BIO204): **May 7, 2020**
Last Day of Class (FRCC): **May 11, 2020**

Tutoring and Office Hours

Virtual tutoring: Karen Sellins (via Zoom):
- *Hours*: Mondays 2:30pm-4:00pm
- *Link*: click here to access
- *Number*: 820 090 028.

Virtual tutoring: Kristopher Parker (via Webex):
- *Hours:* Tuesdays 3:00pm-4:30pm
- *Link*: click here to access
- *Password:* dontpanic
- *Number*: 629 410 733.

Virtual office hours (via Webex): Feel free to join-in to discuss the course or have informal conversations about Life, the Universe and Everything.
- *Hours*: Tuesdays and Thursdays 11am-1pm
- *Link*: click here to access my personal room

CCCS REQUIRED SYLLABUS INFORMATION

Catalog Course Description

Designed for health science majors. Examines microorganisms with an emphasis on their structure, development, physiology, classification, and identification. The laboratory experience includes culturing, identifying, and controlling microorganisms with an emphasis on their role in infectious disease.

Course Learning Outcomes

1. Demonstrate an understanding of the terminology and principles of basic chemistry, cell structure and function, bioenergetics, cell reproduction and genetics, microbial taxonomy, and Darwinian evolution.
2. Demonstrate an understanding of microbial cell biology and genetics.
3. Demonstrate technical laboratory skills, such as microscopy, aseptic techniques, culturing and isolation, and media and material preparation and sterilization.
4. Demonstrate cognitive laboratory skills, such as collection and analysis of data, identification of microbes, and communication of results.
5. Demonstrate an understanding of terminology and principles of immunology, epidemiology, and virology.
6. Integrate themes by examining microbial evolution, diversity, and disease.

Topical Outline

Please refer to the Course Schedule for a detailed breakdown of topics and assignments by date.

1. Introduction: Nature of Science, Historical Perspective of Microbiology and Survey of Microbes
2. Fundamentals of Chemistry
3. Microscopy and Cell Structure
4. Microbial Cell Biology
    a. Structure and Function
    b. Metabolism
    c. Growth
5. Genetics
    a. Inheritance
    b. Mutations
    c. Genetic Engineering
6. Taxonomy
7. Prokaryote and Eukaryote Microbes
8. Viruses
9. Interactions and Impact of Microbes and Humans
    a. Microbial Pathogenicity Mechanisms
    b. Epidemiology
    c. Immunology
    d. Antibiotics and Control of Microbial Growth
10. Integrating Themes
    a. Microbial Evolution, Diversity, and Disease

Guaranteed Transfer (GT) Pathways Course Statement

The Colorado Commission on Higher Education has approved BIO 204 for inclusion in the Guaranteed Transfer (GT) Pathways program in the GT-SC1 category. For transferring students, successful completion with a minimum C– grade guarantees transfer and application of credit in this GT Pathways category. For more information on the GT Pathways program, go to: http://highered.colorado.gov/academics/transfers/gtpathways/curriculum.html.

Natural and Physical Sciences Content Criteria GT-SC1

https://highered.colorado.gov/academics/transfers/gtpathways/criteria/content/content_natural_physical%20sciences_2016_06_02_CCHE_approved.pdf

Competencies and Student Learning Outcomes for GT-SC1

1. Inquiry and Analysis: https://highered.colorado.gov/Academics/Transfers/gtPathways/Criteria/Competency/Competency_Inquiry_and_Analysis.pdf
2. Quantitative Literacy: https://highered.colorado.gov/Academics/Transfers/gtPathways/Criteria/Competency/Competency_Quantitative_Literacy.pdf

Academic Honesty

Students are expected to uphold FRCC's Student Code of Conduct relating to academic honesty and assume full responsibility for the content and integrity of the academic work they submit. The guiding principle of academic integrity will be that a student's submitted work, examinations, reports, discussions, and projects must be that of the student's own work and unique to the course. Students are guilty of violating the honor code if they:

- Represent the work of others as their own (this includes copying material from the Internet for assignments without proper citation)
- Use or obtain unauthorized assistance in any academic work.
- Give unauthorized assistance to other students.
- Modify, without instructor approval, an examination, paper, record, or report for the purpose of obtaining additional credit.
- Misrepresent the content of submitted work.
- Are seen with an electronic device in their hands at any time during an exam.
- The penalty for violating the honor code is severe. Any student violating the honor code is subject to receive a failing grade for the course and will be reported to the Office of Student Affairs. If a student is unclear about whether a particular situation may constitute an honor code violation, the student should contact the instructor to discuss the situation.

Collaboration. Unless otherwise instructed, all work submitted is to be done individually by the student. This means you should not be working in pairs or in a group to complete assignments, take quizzes, and other assessments unless specifically asked to do so by your instructor.

Plagiarism / Dual Submission. Plagiarism, whether intentional or accidental, is academic dishonesty and may incur disciplinary action ranging from receiving a zero on an assignment or failing a course to more severe consequences. Plagiarism means:

- Using someone else's ideas and not correctly citing that use. This means that if you put someone else's work into your own words, put it in your work, and do not correctly document it, the idea is plagiarized.
- Using someone else's words without quotation marks and not correctly citing that use.
- Using someone else's images or other works (such as from the Internet) without correctly citing that use.
- Submitting work that has been turned in for credit in another class or at another institution unless specifically permitted by your instructor.

Student Rights, Responsibilities, and Resources

For important information on rights and responsibilities of all FRCC students, as well as the many support resources available to you, please refer to the link to "Student Rights, Responsibilities and Resources" on D2L. Topics include:

- Course Questions
- Access to Course Materials
- Student Email
- Student Drop for Non-Attendance
- Payment Deadline
- Financial Aid
- Academic Assistance
- Disability Support Services
- Use of Audio / Video Recordings
- Crisis Counseling and Stress Management
- FRCC Cares
- Notice of Non-Discrimination
- Mandatory Reporting (Title IX)
- Student Code of Conduct
- Philosophy of Inclusion

COURSE OVERVIEW

Instructor's Overview of the Course

The broad goal of this course is to facilitate the acquisition of a microbiology vocabulary that will enable learners to responsibly apply microbiology knowledge as a tool to enact positive change within the context of their chosen fields. Acquisition of this knowledge will be facilitated through content-based lectures, completion of laboratory modules, and participation in online activities.

Graded Instructional Activities ~ Overview

1. CONNECT Preparation for Microbiology Module (30 points total). Microbiology builds on many fundamental concepts typically learned in a 100-level biology course. A timed diagnostic tool has been built in CONNECT to determine the learner's level of preparation for this course. Full points will be awarded for the **completing this assignment by 11:00am on January 23, 2020.** Detailed information will be provided in-class regarding how to interpret/use results to achieve the best chance of success in this course. *Students that score below a certain percentage will be required to complete two additional assignments (Boot Camps) to earn full points.*
2. CONNECT Reading Assignments (100 points total): For each chapter, there is a required CONNECT reading assignment (LearnSmart). The cumulative percentage earned on all readings will be used to determine the grade out of 100 points (e.g. cumulative 93% = 93 out of 100 points). Readings relate directly to the lecture material covered in the week immediately preceding their due date. These are open resource and are **due by 11:59pm on the Sunday following the week of their respective lecture** (see: Course Schedule). *Only the first attempt will be recorded as a grade.*
3. CONNECT Quizzes (140 points total): CONNECT quizzes are graded separately from readings. They are open resource and are **due by 11:59pm on the Sunday following the week of their respective exam** (see: Course Schedule). Quizzes are worth 10 points each and the fourteen highest quiz scores will be recorded out of 140 points (i.e. the two lowest quiz grades will be dropped). *Only the first attempt will be recorded as a grade.*
4. Current events poster assignment (80 points total). From studies of the human microbiome to emerging antimicrobial resistance, advances in biotechnology, microbial impacts on climate change, and the COVID-19 pandemic, popular press articles about microbiology are ubiquitous. Students will select a specific topic of focus and use press articles, the scientific literature, and other resources to prepare a 'mock' poster. A total of 20 points may be earned for meeting deadlines and **submitting a completed poster by 11:59pm on Sunday, May 10.** Each student will complete an anonymous evaluation of an anonymous classmate's topic, poster title, and abstract. Up to 11 points may be earned from the classmate evaluations with an additional 7 points potentially earned from the instructor's evaluation. The remaining 42 points will be determined by the instructor based upon the criteria outlined in the poster evaluation rubric. Evaluation rubrics, examples, and additional details will be provided on D2L. *Students will have two opportunities to earn extra credit for the current events poster assignment (see: Extra Credit on last page).*
5. Lecture Exams (100 points each; 400 points total). Exams 1 and 2 were closed resource exams taken in-class prior to the transition to virtual and covered Chapters 1 and 3-10. Exam 3 and the Final Exam will be taken online through CONNECT and **will be limited resource**. *Hand-written* notes on a single notecard will be allowed (4" x 6" maximum size). The Final Exam is cumulative and will also include material from Chapters 14, 15, 16, and 17. In order to begin an exam, students will be required to join a Webex meeting hosted by the instructor. There will be three separate timeslots available during an exam week (see: Course Schedule). Exam 3 and the Final Exam will include multiple-choice, true-false, matching, and/or fill-in-the-blank questions. Chapter outlines, objectives, lecture slides, and a recorded review session will be provided on D2L.
6. Lab Participation, Virtual Labs, and Lab Report. Lab 1-7's exercises and the required CONNECT labs contain results and questions that learners are responsible for completing as part of the laboratory component of this course. It is important to note that attendance and participation in previous lab exercises (1-7) will account for 20 points of this graded assignment. An additional 40 points have been allocated to the CONNECT labs. The remaining 40 points have been relocated to a written report for one of Lab 3, Lab 5, Lab 6, or Lab 7 **due by 11:59pm on Sunday, May 10.** A points breakdown and rubric for the reports is available on D2L.
7. Comprehensive Lab Practical Exam. A comprehensive practical exam will be **administered on May 7, 2020 through CONNECT** and will include the techniques and information covered across the in-class lab exercises for labs 1-7 and the online labs taken via CONNECT. The lab practical is closed resource and will be proctored in a similar fashion described above for the lecture exams. On May 7th, students will be given the opportunity to join the Webex call and begin the practical **anytime from 6am to 10pm.** An updated study guide will be provided on D2L. Several review opportunities will be provided for learners, including a virtual review via Zoom given by Heidi Smith on Wednesday, April 29th at 12pm.

Grades ~ Breakdown, Scales, and Standards

Activity	Contribution to overall grade
Lecture Exams	400 points (100 points each)
Comprehensive Lab Practical	150 points
CONNECT Quizzes	140 points (10 points each)
CONNECT Reading Assignments	100 points
Participation, Virtual Labs, Lab Report	100 points
Current Events Poster	80 points
CONNECT Prep for Micro	30 points
Total	**1000 points**

These are the letter grades that will be reported for your official transcript based on the number of points earned throughout the course:

Letter Grade	Range
A	895 to 1000 points (89.5% to 100%)
B	795 to 894 points (79.5% to 89.4%)
C	695 to 794 points (69.5% to 79.4%)
D	595 to 694 points (59.5% to 69.4%)
F	Less than 594 points (< 59.4%)

Late Work/Make up Work Policy

1. Missed CONNECT Reading Assignments and Quizzes: You are responsible for completing every assignment on time. *There will be no makeup quizzes or homework assignments, including those missed due to illness, accident, unforeseen emergency, or individual computer issues.* It is for these reasons that two quizzes will be dropped from your final grade. Please do not email me a request to reset deadlines as this cannot be done for one individual student. If a CONNECT assignment is missed, it can still be completed after the due date as a study attempt for no points.
2. Makeup Labs: *Due to the nature of the materials used in this course, there are no makeup labs.* When you are absent, you affect your entire lab group by placing extra work on their shoulders. Therefore, it is imperative that you attend every class as there is a lab component to almost every scheduled meeting. If you are absent, you will be docked related points, and you will still be tested on the material. It is your responsibility to check with your group to learn what was missed. If you missed any part of Lab's 3, 5, 6, or 7, please contact your instructor. *There is no credit given for late Lab Reports;* these will be accepted electronically via D2L/email until 11:59pm on Sunday, May 10.
3. Makeup Lecture Exams: *All All students are allowed one makeup written/online exam missed due to illness, accident, unforeseen emergency, or any other circumstance.* **This is a no questions asked situation**. (i.e. the instructor will not ask why an exam was missed; please do not provide that information). Students must contact the instructor within 24 hours of the missed exam. Within one week of the missed exam, the instructor and student will agree upon a time to makeup the exam by virtual means (see: Lecture Exams on previous page.) The makeup exam will cover the same content as the one missed, but it may be in an entirely different format.
4. Makeup Lab Practical: *There is absolutely no makeup lab practical exam* so make sure that you do not miss this exam. If you do miss this exam, you receive an Incomplete (only if you qualify) and will be required to take the practical at the end of the next semester to receive credit.

Attendance, Participation, and Conduct

Attendance/Participation. Student attendance and participation in this course are essential to learning the material. Students are expected to attend each laboratory session, be on time, and stay for the entire session. There may be time remaining after the completion of lab exercises. Come prepared with questions on chapter materials so these can be addressed during that time. *The last date of attendance is recorded and may have financial aid implications for students that do not pass the course.*

Classroom Conduct. Students are expected to assist in maintaining a classroom environment that is conducive to learning and is respectful to the instructor and other students. Students should not be using cellular phones, tablets, or laptops for anything except academic research as part of class activities. Offensive remarks, disruptive activity, or unsafe laboratory practices will not be tolerated, and you may be asked to leave the classroom and potentially lose points for an activity.

Food/Beverages: No food or drink of any kind, *including water*, is permitted in the class at any time.

Course Schedule

Week/Day	Date	Lecture Topic	Lab	DUE
1: Tue.	Jan. 21	Syllabus Overview Chapter 1, part 1	Overview and Lab Safety	NA
1: Thu.	Jan. 23	Chapter 1, part 2	1: Microscopy	Diagnostic Tool; Reading, Ch 1
2: Tue.	Jan. 28	Chapter 3	2: Aseptic Technique	Reading, Ch 3
2: Thu.	Jan. 30	Chapter 4	2: Aseptic Technique	Reading, Ch 4 Boot Camp Part 1
3: Tue.	Feb. 4	Chapter 5	NA	Reading, Ch 5
3: Thu.	Feb. 6	Chapter 6	3: Smears and Stains	Reading, Ch 6; Boot Camp Part 2
4: Tue.	Feb. 11	Exam 1 Review	3: Smears and Stains	Quizzes Ch 1, 3, 4, 5, 6
4: Thu.	Feb. 13	Exam 1 (Ch 1-6)	3: Smears and Stains	NA
5: Tue.	Feb. 18	Chapter 7	4: Isolation and Enumeration	Reading, Ch 7
5: Thu.	Feb. 20	Chapter 8, part 1	4: Isolation and Enumeration	Reading, Ch 8, part 1
6: Tue.	Feb. 25	Chapter 8, part 2	5: Environmental Preferences	Reading, Ch 8, part 2
6: Thu.	Feb. 27	Chapter 9	5: Environmental Preferences	Reading, Ch 9
7: Tue.	Mar. 3	Chapter 10, part 1	6: Transformation	Reading, Ch 10, part 1
7: Thu.	Mar. 5	Chapter 10, part 2	6: Transformation	Reading, Ch 10, part 2
8: Tue.	Mar. 10	Exam 2 Review	7: Control and Growth	Quizzes Ch 7, 8, 9, 10
8: Thu.	Mar. 12	Exam 2 (Ch 7-10)	7: Control and Growth	NA

Date:	Lecture coverage	ITEMS DUE	DUE DATES
Week of: March 16	No Class - (Spring Break)		
Week of: March 23	No Class - (COVID-19 Break)		
Week of: March 30	Chapter 11 Chapter 12	Reading, Ch 11 Reading, Ch 12, part 1 Poster, Deadline #1	by 11:59pm on Sunday, April 5
Week of: April 6	Chapter 12 Chapter 13	Reading, Ch 12, part 2 Reading, Ch 13, part 1 Reading, Ch 13, part 2 Poster, Deadline #2	by 11:59pm on Sunday, April 12
Week of: April 13	Exam 3, first option on Apr. 14; Exam 3, second option on Apr. 15; Exam 3, third option on Apr. 16	Quizzes, Ch 11, 12, 13 Poster, Deadline #3	by 11:59pm on Sunday, April 19
Week of: April 20	Chapter 14 Chapter 15	Reading, Ch 14 Reading, Ch 15	by 11:59pm on Sunday, April 26
Week of: April 27	Chapter 16 Chapter 17	Reading, Ch 16 Reading, Ch 17 Poster, Deadline #4	by 11:59pm on Sunday, May 3
Week of: May 4	Final Exam, first option May 5; Final Exam, second option May 6; Final Exam, third option May 7; Lab Practical on May 7 may be taken anytime from 6am and 10pm	Quizzes, Ch 14, 15, 16, 17 Lab Report Virtual Lab (Unknown) Virtual Lab (Medical) Poster, Deadline #5	by 11:59pm on Sunday, May 10
Day of: May 11	(optional) Poster Presentations	NA	

EXTRA CREDIT

- *Extra Credit:* (Option 1) Students will be given the option to prepare a 7-minute presentation overviewing their Current Events Poster for up to 16 points of extra credit. (Option 2) Students will have the opportunity to provide real-time constructive feedback through assessment of a classmate's poster and presentation to earn up to 7 extra credit points. Presentations and classmate feedback will occur **on Monday, May 11.** Students interested in presenting and/or assessing a poster will be asked to fill out an availability sheet which will be used to collectively determine appropriate timeslots for conducting presentations. Additional details, expectations, and a rubric for the assessment will be added to D2L.