Lab is a **separate class** from the lecture. The timing of lab and lecture topics **will not always align depending on schedules**. Even though they are less credit hours, **labs will require the same amount of study time**! You are required on the first day of class to bring a printed or digital copy of this syllabus to class, sign off you understand all the information below, and will abide by all lab rules.

TENTATIVE SCHEDULE for

**MCB 2010L – Microbiology Laboratory for Health Sciences**

Spring 2020

Course Reference # MCB 2010L -\_\_\_ \_\_\_ - \_\_\_ \_\_\_ \_\_\_

|  |  |  |  |
| --- | --- | --- | --- |
| Week Of | Exercises in Lab Manual | Exercise Topic | Lab Manual Pages |
| Jan 14-16 | 1 | Introduction, Safety $ | p. v-viii |
|  | 1 | Brightfield Microscopy | p. 1-12 |
|  | 2 | Bacterial Shapes | p. 13-16 |
| Jan 21-23 | 3 | Dark Field Microscopy $ | p. 17-22 |
|  | 3 | Phase-Contrast | p. 17-22 |
|  | 4 | Motility | p. 23-28 |
| Jan 28-30 | 5 | Pure Culture Technique $ | p. 29-34 |
|  | 6 | Smear Preparation | p. 35-44 |
|  | 6 | Simple Staining | p. 35-44 |
| Feb 4-6 | 7 | Gram Staining $ | p. 45-50 |
|  | 8 | Acid-Fast Staining | p. 51-54 |
| Feb 11-13 |  | **Practical Exam 1;** Protists, Fungi, Helminths $ | p. 55-60 |
| *Feb 18-20* | 9 | Protists, Fungi, Helminths cont. (*Microscope Exam opens)*; $ | p. 55-60 |
| Feb 25-27 | 10 | Effects of Radiation on Growth | p. 61-66 |
|  | 11 | Evaluation of Antiseptics | p. 67-72 |
|  | 12 | Importance of Handwashing | p. 73-78 |
| Mar 3-5 | 10-12 | Results of Handwashing, Radiation, Antiseptics | p. 61-78 |
|  | 13 | Effects of Temperature on Growth  (*Last day to complete Microscope Exam)* | p. 79-86 |
| Mar 10-12 | 15  16 | **Practical Exam 2;**  EnteroPluri System (demo)  Antibiotic Sensitivity (set up only) | p. 93 -100  p. 101-106 |
| *Mar 16-20* |  | ***Spring Break; no lab*** |  |
| Mar 24-26 | 16  17  18 | Results of Antibiotic Sensitivity  Staplycocci  Streptococci  ***Withdrawal Date: (W 25 March 2020)*** | p. 101-106  p.107-112  p.113-118 |
| Mar 31- Apr 2 |  | Unknown Analysis Part 1 \* | Handouts |
|  | 20 | Transmission of Infection | p.123-126 |
| Apr 7-9 |  | Unknown Analysis Part 2. \* | Handouts |
|  | 19 | Antibiotic Resistant Bacteria | p. 119-122 |
| Apr 14-16 |  | **Practical Exam 3** |  |

**$ =** Microscope Storage Checks = 5 points each\* **=** Unknown Analysis = 50 points each

**COURSE DESCRIPTION:** This is the lab component for MCB 2010. Lab experiences include the following topic areas of viruses, bacteria, protozoans, and multicellular parasites.

**PREREQUISITE:** BSC 2010 & BSC 2010L

**COREQUISITE:** MCB 2010

**CONTACT INFORMATION**:

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| **Instructor of Record, IOR: Christopher D. Krause, Ph.D.** |
| [**http://ckrause-irsc.weebly.com/**](http://ckrause-irsc.weebly.com/) |
| **Email:** [**ckrause@irsc.edu**](mailto:ckrause@irsc.edu) |

On Day 1 of your lab class, your Instructor will introduce themselves as the **Instructor of Record** **(IOR)** for this course. **Please write their name and contact information above** (both can also be found with the links provided). The IOR is responsible for the selection of experiments and exams developed and approved by Biology Department Faculty, approves all assignments, and assigns the student’s grade for the course. In addition to the IOR, a **Technical Lab Specialist (TLS)** *may* also assigned to this course. The role of the **TLS** is to facilitate the performance of the assigned experiments within the laboratory setting. The **TLS** also assists with the grading of assessments under the direction of the course instructor and other biology faculty. If you have any questions or concerns, please first try to work with the course **TLS/IOR**. If the issue cannot be resolved, Lab Coordinator Sarah Rodgers (772-462-7149, srodgers@irsc.edu) is also available to assist. Any correspondence must include the **student’s name** and **course reference number**. The IOR/TLS/Coordinator will generally respond to the student within 2 business days *(note: failure to include* ***name*** *and* ***reference number*** *in initial correspondence, may result in delayed to no response)*.The IOR reports the grade the student earns over the course of the semester and will issue any incompletes (I) or withdrawals (W) that are needed.

**REQUIRED LAB MANUAL**: MCB2010L Health Care Microbiology Lab Manual, 2nd ed., 2017.

ISBN 978-0-7380-9782-4

**REQUIRED SUPPLIES:** Lab Coat, available in Bookstore

**Additional Resources Available:** [http://biology-irsc.weebly.com](http://biology-irsc.weebly.com/)

|  |
| --- |
| The **Miley** **Library** serves as IRSC's main library.  The library is an information place providing professional assistance, library books and media, and access to the library's electronic resources. There is an extensive online database system also available through IRSC’s website [www.irsc.edu](http://www.irsc.edu) |

**GRADES:** Grades are based on 460 total points consisting of:

* (3) 100 point unit Practical exams (300 pts total),
* Microscope Exam (35 pts total),
* (5) 5 point Microscope Storage Checks (25 pts total),
* Unknown Microbe Analysis Report (Part 1. 50 points, Part 2. 50 points = 100 pts.total).

\*\*\***See ATTENDANCE policy below that will affect your grade\*\*\***

Course grades are assigned on the following basis and parentheses () include the minimum points needed for that grade:

**A:** 90% - 100% (> 414 pts)

**B:** 80% - 89% (> 368 pts)

**C:** 70% - 79% (> 322 pts)

**D:** 60% - 69% (> 276 pts)

**F:** below 60% (< 276 pts)

Students must keep up with their grades on assignments/exams over the course of the semester. Grades posted in Blackboard are not final and may need adjustment throughout the semester (due to miscalculations, typo, or programming error) and will be recalculated accordingly if needed. It is the student’s responsibility to monitor their own grade and also to approach the instructor for academic support/suggestions if the student is not earning the grade they desire or sees any discrepancy with what is posted on Blackboard. **Instructor contact must be administered in a timely manner**, as last minute concerns cannot be addressed or remedied, nor can they positively impact final grades.

Your instructor may choose to go over the test in class or may only offer review outside of lab class time, but you always have the ability to request to view your test grade although your test itself will remain in the instructor’s possession.

**\*\*\*No extra credit projects will be granted and there are no homework points for this course; your grade is entirely made up of the three 100 point exams, Microscope Exam and Storage, and the Unknown Analysis Report.\*\*\*** *Schedule your work, activities, and personal needs around these SET DATES as there is no ability to catch up as labs are changed over weekly and cannot be “re-set-up.”*

W = student withdraw by Wed., March 25, 2020 I = incomplete for passing students only in EXTREME cases

which *must be approved by the IOR*

If a student withdraws from the course, the student must email both the TLS and IOR. **The IOR will respond with a confirmatory email that the student has been withdrawn.** This is to minimize the number of Instructor Withdrawals (WI) that are requested after final grades are posted. Requests for Instructor Withdrawal (WI) after the student has taken the final exam are prohibited, thus if you are concerned about your grade and it is past the Student Withdrawal date, you need to discuss this with your Instructor prior to taking the final exam in the semester.

**EXAMS:** Students are responsible for knowing their exact dates and times of their Exams based off the

schedule above. **You will NOT be permitted late, *even if it’s 30 seconds*, so plan accordingly.** Thisis to ensure all students have a fair and equal testing experience. Exams will be **timed** rotational station-based practical’s in which the students will view parts of the experiments they conducted in the weeks prior and will be expected to answer questions pertaining to that specific lab. Like all lab class periods, the students will be physically required to participate by walking and standing at each station during the test. Students will not be able to return to a station; only one rotation of the stations is allowed. You will NOT be able to attend another instructor’s lab for an Exam if you have missed yours. Make-up dates are available for this course ONLY **if the absence is approved by the DEPARTMENT CHAIR** (see “Make-up Policy” below) and will be administered on the Monday following testing week @ Main Campus only.

**UNKNOWN ANALYSIS REPORT:** Students will be required to complete/ submit two digital lab analysis reports

via Blackboard (50 possible points each) based upon all techniques practiced in the course. Details will be discussed during lab but general information including templates, examples, and submission directions are posted within your Blackboard shell and available on the Biology Weebly site <http://biology-irsc.weebly.com/mcb2010l-microbiology-lab.html> Submission Dates for each portion of the analysis differ: UNK1 will be due two weeks prior to the third/final exam and UNK2 will be one week prior to the third/final exam and are noted above as asterisks \* in your syllabus. These are HARD deadlines set in Blackboard thus they will not be accessible after the due dates listed in the syllabus schedule above. **Experiments to identify your unknown MUST be completed during your regularly scheduled lab**, thus if you are absent during one of the Unknown Analysis days, you \*MAY\* not be able to make-up the experiments and this will result in a lower grade for this assessment. If you need more time outside of class you can request to attend an “ALP” or schedule time in Open Lab (see below for details on both).

**OPEN LAB POLICY:** Main Campus only: 8:30am -4:45pm M-R and only available during weeks WITHOUT scheduled Practical Exams. NOTE FOR MICRO LABS: you cannot perform any experiments or inoculate any cultures. See Weebly online for more details <http://biology-irsc.weebly.com/open-lab-information.html>

**ATTENDANCE:** **MANDITORY.** All students (*including DUAL Enrollment students)* are expected to be present and punctual in lab in order to accomplish the learning goals for the lab practical examinations. It is solely the students responsibility to sign into following lab C.O.D.E. in order to be counted present. Lab C.O.D.E. is = Correct Attire, On Time, no Drinks no Eating. TLS/IOR’s are not expected to remember students attendance nor will be held liable for a student failing to sign in. Attendance will be taken at the start of class using Qwickly within BlackBoard; **failure to arrive on time will be marked as Absent. It is up to the instructor’s discretion as to his/her definition of “Late” during non-practical days but IS NOT FLEXIBLE for Practical EXAM days, *No Exceptions*!!!** This is because students take lab Practical’s as an entire group, rotating from station to station, thus a student cannot enter once the exam has started.

**Fifteen points (which is 3% of your final grade) will be taken off for *EACH lab class missed*;** absences will be assessed at the end of the course.**Students will receive 1 free absence *per semester* *regardless of reason.*** This ‘freebee’ is available for any emergency, medical, travel, or personal business that may arise and possibly prevent a student from attending class and does not need to be approved to utilize. Thus, emailing the instructor because you “had to go to the ER” is not necessary (*unless it involves a test day).* Please note, missing a second day in lab, *regardless of reason*, will not be Excused and you will be penalized by a 3% point deduction listed above. For example: prior to taking attendance into account, a student ends the semester with 370/460 points which is a B or 80% but actually missed two lab classes duringthe semester. Thus they would be docked -15 points (370 - 15 = 355 / 460) which calculates to a 77% and the student would receive a C in the course.

**Alternative Lab Participation (ALP):** If you happen to know you will be missing a lab class or need more time on your UNK Analysis, check the Weebly lab schedule immediately to review possible alternative options to participate in another instructor’s lab so you will not miss that week’s experiment. Attending another instructor’s lab **does NOT count as “attending” your regularly scheduled lab**, but will ensure you have the ability to learn the content you ***will be tested on.*** You can find other lab times and locations at [http://biology-irsc.weebly.com](http://biology-irsc.weebly.com/laboratory-schedules-click-here-for-current-semesters-schedule-of-all-the-labs-on-all-campuses.html). You will need to contact the alternative lab’s instructor to ask permission if you can attend (students cannot attend if the instructor’s lab does not have an alternative lab bench seat available: max is 24 seats). It is the student’s responsibility to initiate finding a time and day that works with their schedule to ensure they do not miss learning content.

To effectively utilize lab time, preparation is required on the part of the student. The student should

read the assigned laboratory exercises **prior to class** to become familiar with details for lab BEFORE lab starts. (NOTE: The above schedule is only tentative and each student is responsible

for knowing his/her exact lab days.)

**EXTRA CREDIT:** No extra credit is given.

**LAB ATTIRE:** Appropriate attire is required for your protection. In keeping with Federal regulations, **students are required to wear flat closed-toe, close-heel shoes in laboratory**. The attire worn in the laboratory work setting should include full coverage of legs (long pants or skirt), shirt with sleeves (not low cut and no bare midriff), hair restraints for long hair, and no dangling jewelry. **If you do not come properly dressed for lab, you will NOT be allowed into class or permitted to enter to take your Exam which will result in a score of “0” (zero points) for that Exam. NO EXCEPTIONS.**

**ELECTRONIC DEVICES:** All electronic communication devices are prohibited during exams or quizzes. The use of cell phones are prohibited during class and must be set on *silent* or *off* during the class period.  Any student who uses a cell phone to make or answer a call, or send and/or read text messages or emails during class time may be asked to leave and considered absent for that class. Electronic devices may be used to take pictures of slides or models when permitted by the instructor.

**CHEATING:** Cheating of ANY kind **WILL NOT** be tolerated by this Department or the College. *Anyone caught cheating will automatically receive a minimum of a zero for that assignment/test.* Any further episodes will result in an F in the class. Anyone who witnesses this inexcusable behavior and does not report it is also considered to be guilty of improper conduct.

**PLAGIARISM:** This course follows IRSC guidelines (link below), thus any student *plagiarizing will receive a 0*

*on the Unknown Assessments.*

<https://www.irsc.edu/uploadedFiles/Libraries/Tutorials/Plagiarism.pdf>

**MAKE-UP POLICY:** Students must attend class and take all exams in the course reference number they are registered in. If a student misses a Practical Exam they must contact a Department Chair (Dr. Robin Willoughby [rwilloug@irsc.edu](mailto:rwilloug@irsc.edu) or Dr. Jennifer Capers [jcapers@irsc.edu](mailto:jcapers@irsc.edu)) **within 24 hours of the schedule exam time** with a *verifiable emergency*. Any correspondence must include the **student’s name** and **full course reference number**. Instructor’s, Faculty or Lab Coordinator’s cannot approve a student to take a make-up exam. Students whom miss more than one exam, regardless of reason, will be withdrawn from the course. *Approved* make-up exams are only given the Monday following the week the practical was given @ Main Campus only. Timeframe of the Monday make-up exam will be determined during testing week, thus if you miss your exam, you will need to contact your instructor immediately about your situation and options. If a student misses or cannot attend the opportunity to take their “approved” make-up exam, the student’s academic status will determine if the IOR will assign a “WI” Instructor Withdrawal or “I” Incomplete grade for the course. If awarded an “I” the student will be required to return to make up the exam the following semester. Please NOTE: Make-up exams are standardized test and are generally more difficult as they are not written by the student’s particular instructor. If a student misses the last exam, they must contact a Department Chair (Dr. Robin Willoughby [rwilloug@irsc.edu](mailto:rwilloug@irsc.edu) or Dr. Jennifer Capers [jcapers@irsc.edu](mailto:jcapers@irsc.edu)) **within 24 hours of the schedule exam time** with a *verifiable emergency*. Only with an approved verifiable emergency via the IOR, and only if they are currently passing the course, will a student be eligible to receive an incomplete (I) for the course. If a student is not passing the course prior to the last exam, the missed final will count as a score of zero “0” as described above and will be used in calculations of the students final earned letter grade in the course.

If awarded an Incomplete “I” the student must find an instructor’s class that fits their schedule to following semester, email that instructor for permission to attend his/her Exam # and also email/contact their original instructor to convey this information. Schedule and instructor contact info can be found on [http://biology-irsc.weebly.com](http://biology-irsc.weebly.com/). Failure to do so before the end of the subsequent semester will result in their missed exam counting as a zero “0” and will be included their final grade in the course.

**LEARNING OUTCOMES:** at the completion of the course, the student will be able to:

* Communicate major microbiology concepts and relate how these are connected within various areas of the biological and physical sciences in a health science laboratory setting.
* Apply problem solving, analytical, and communication skills based on the scientific method that will provide the foundation for lifelong learning and career development.

**STUDENT ACCESSIBILITY SERVICES:** Indian River State College provides reasonable accommodations to students with documented disabilities through the Student Accessibility Services (SAS) Office. The rights of students with disabilities which pertain to post-secondary education are provided under Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act (ADA) of 1990. Students who wish to request an accommodation for a documented disability may contact Student Accessibility Services at 772-462-7808, 772-462-7782 or e-mail [accessibilityservices@irsc.edu](mailto:accessibilityservices@irsc.edu). The ***Student is responsible to inform the instructor at the beginning of the semester*** so lab managers, staff, and the instructor have ample time to prepare any testing accommodations that will be needed.

**NON-DISCRIMINATION AND NON-HARASSMENT POLICY:** Indian River State College and its faculty are committed to supporting our students and seeking an environment that is free of bias, discrimination, and harassment. IRSC does not discriminate on the basis of race, color, national origin, ethnicity, sex (pregnancy), religion, age, disability, sexual orientation, marital status, veteran status or genetic information in its programs and activities. If you have encountered any form of discrimination or harassment, including sexual misconduct (e.g. sexual assault, sexual harassment, stalking, and domestic or dating violence), we encourage you to report this to the Title IX Coordinator. If you report such an incident of misconduct to a faculty member, that faculty member is required by law to notify the IRSC Title IX Coordinator. The following person has been designated to handle inquiries regarding non-discrimination and non-harassment policies: Adriene B. Jefferson, Equity Officer and Title IX Coordinator, 3209 Virginia Avenue, Fort Pierce, FL 34987; IRSC Main Campus, W Building, Room 207; (772)462-7156; [ajeffers@irsc.edu.](mailto:ajeffers@irsc.edu)

**STATEMENT OF UNDERSTANDING of LAB MANAGEMENT PROCEDURES:**

The following is a list of practices required for safety purposes in the laboratories and in outdoor activities. Following rules of lab safety and using common sense throughout the course will enhance your learning experience by increasing your confidence in your ability to safely use chemicals and equipment. Pay particular attention to oral and written safety instructions given by the instructor. If you do not understand a procedure, Ask the Instructor, rather than a fellow student, for clarification. Be aware of IRSC’s policies and procedures regarding accident liability and any medical care needed as a result of a laboratory or outdoor accident.

**The following rules of laboratory safety should become a habit:**

* Report all accidents, injuries, and breakage of glass or equipment to instructor immediately.
* To prevent possible hazards to eyes or contact lenses, wear safety glasses or goggles during exercises in which glassware and solutions are heated, or when dangerous fumes maybe present.
* Assume that all reagents are poisonous and act accordingly. Read the labels on chemical bottles for safety precautions and know the nature of the chemical you are using. If chemicals come into contact with skin, wash immediately with water.

**DO NOT:**

* Taste, smell or ingest chemicals or pipette anything by mouth.
* Eat, drink or smoke in the lab at any time! Toxic materials may be present, and some chemicals are flammable.
* Carry reagent bottles around the room.
* Pour chemicals back into containers or chemicals in the sink or trash unless instructed to do so.
* Light a Bunsen burner near a gas tank or cylinder or move a little Bunsen burner.
* Operate any equipment until you are instructed in its use.
* Wear clothing that is extremely loose or tight fitting. Overly tight clothes, such as leggings and body suits, are not recommended, as any spilled material will be held next to the skin by these garments
* Wear overly loose clothing, long necklaces, ties, or scarves that can get caught in equipment or knock over work materials. Loose clothing should be secured so they do not get caught in a flame or chemicals.
* Wear jewelry under disposable gloves or when working on equipment.
* Work with matches, lighted splints, Bunsen burners, etc. when wearing acrylic nails.
* Attempt to change the position of glass tubing in a stopper.
* Point a test tube being heated at another student or yourself or ever look into a test tube while you are heating it.
* Attempt unauthorized experiments or procedures.
* Lean, hang over or sit on the laboratory tables or lift any solutions, glassware or other types of apparatus above eye level.
* Leave your assigned laboratory station without permission of the instructor.
* Fool around or "horse play" in the laboratory. Students found in violation of this safety rule will be barred from participating in future labs and could result in suspension.

**DO:**

* Follow all instructions given by your instructor.
* Report to the instructor any condition that appears unsafe or hazardous. Report all accidents to the instructor immediately, and ask your instructor for assistance in cleaning up broken glass and chemical spills.
* Note the location of emergency equipment such as a first aid kit, eye wash bottle and station, fire extinguisher, and switch for safety ceiling showers, fire blankets, sand bucket, and telephone (911).
* Work quietly — know what you are doing by reading the assigned experiment before you start to work
* Become familiar with the experiments you will be doing before coming to the laboratory. This will increase your understanding, enjoyment, and safety during exercises. Confusion is dangerous. Completely follow the procedures set forth by the instructor. Pay close attention to any cautions described in the laboratory exercises
* Store your books, bags, etc. on the shelves or under the work tables. If under the tables, make sure that these items cannot be stepped on.
* Keep your work area neat, clean and organized. Before beginning, remove everything from your work area except the lab manual and equipment, used for the experiment. Wash hands and desk area, including desk top and edged before and after each experiment. Use clean glassware at the beginning of each exercise, and wash glassware or at the end of each exercise or before leaving the laboratory.
* Wear clothing that, if damaged, would not be a serious loss, or use aprons or laboratory coats, since chemicals may damage fabrics.
* Wear safety goggles to protect your eyes when heating substances, dissecting, etc.
* Wear lab coats, safety glasses and gloves when in the lab. Shorts and sandals may not be worn into the lab even under a lab coat.
* Wear full coverage shoes that are non-skid and constructed of sturdy material must be worn at all times while in the lab as protection against broken glass or spillage that may not have been adequately cleaned up. No flip flops or sandals are permitted.
* Tie back long hair so it does not come in contact with fire, chemicals, biological or radiological substances or if there is a possibility of becoming entangled in equipment.
* Learn how to transport all materials and equipment safely.
* Handle hot glassware with a test tube clamp or tongs. Use caution when using heat especially when heating chemicals. Do not leave a flame unattended; make certain gas Jets are off when the Bunsen burner is not in use. Use proper ventilation in hoods when instructed;
* Keep solids out of the sink.
* Read chemical bottle labels; be aware of the hazards of all chemicals used. Know the safety precautions for each.
* Stopper all reagent bottles when not in use. Immediately wash reagents off yourself and your clothing and if there still on you, immediately inform the instructor. If you accidentally get any reagent in your mouth, rinse out with water thoroughly, and immediately inform you instructor.
* Use extra care and wear disposable gloves when working with glass tubing and when using dissection equipment scalpels, knives, or razor blades, when cutting or assisting.
* Administer first aid immediately to clean, sterilize, and cover any scrapes, cuts, and burns where the skin is broken and/or where there may be bleeding. Wear bandages over open skin wounds.
* Use caution during any outdoor activities. Watch for snakes, poisonous insects or spiders, stinging insects, poison oak, poison ivy, and so on. Be careful near water.

I understand and will abide by the IRSC Lab Safety Management Procedures AP-8.321 and all other instructions given by the instructor I am aware that should I commit any violation, my lab access privileges may be revoked and disciplinary action including suspension and/or dismissal and appropriate legal action may be taken.

**Student Printed Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Signature \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Reference #\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**