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 to print out the syllabus.You may bring a tablet or laptop to lab if you do not want to print the pages

TENTATIVE SCHEDULE for

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

Spring 2019

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

|  |  |  |  |
| --- | --- | --- | --- |
| Week Of | Exercises in Lab Manual | Exercise Topic | Lab Manual Pages |
| Jan 8 -10 | 1 | Introduction, Safety $ | p. v-viii |
|  | 1 | Brightfield Microscopy | p. 1-12 |
|  | 2 | Bacterial Shapes | p. 13-16 |
| Jan 15 -17 | 3 | Dark Field Microscopy $ | p. 17-22 |
|  | 3 | Phase-Contrast | p. 17-22 |
|  | 4 | Motility | p. 23-28 |
| Jan 22 - 24 | 5 | Pure Culture Technique $ | p. 29-34 |
|  | 6 | Smear Preparation | p. 35-44 |
|  | 6 | Simple Staining | p. 35-44 |
| Jan 29 - 31 | 7 | Gram Staining $ | p. 45-50 |
|  | 8 | Acid-Fast Staining | p. 51-54 |
| Feb 5 - 7 |  | **Practical Exam 1;** Protists, Fungi, Helminths $ | p. 55-60 |
| Feb 12 - 14 | 9 | Microscope Exam; Protists, Fungi, Helminths cont. $ | p. 55-60 |
| Feb 19 - 21 | 10 | Effects of Radiation on Growth | p. 61-66 |
|  | 11 | Evaluation of Antiseptics | p. 67-72 |
|  | 12 | Importance of Handwashing | p. 73-78 |
| Feb 26 – 28 | 10-12 | Results of Handwashing, Radiation, Antiseptics | p. 61-78 |
|  | 13 | Effects of Temperature on Growth | p. 79-86 |
| Mar 5 - 7 |  | **Practical Exam 2** |  |
| Mar 12 - 14 | 15 | EnteroPluri System (set up only) | p. 93-100 |
|  | 16 | Antibiotic Sensitivity (set up only) | p. 101-106 |
| Mar 18 - 22 |  | **No Classes – Spring Break** |  |
| Mar 26 - 38 | 15-16 | Results of EnteroPluri / Antibioc Sensitivity | p. 93-106 |
|  |  | Infection Control DVD  ***(Withdrawal Date: M 25 March)*** |  |
| Apr 2 - 4 | 17 | Staplylococci | p. 107-112 |
|  | 18 | Streptococci | p. 113-118 |
| Apr 9 - 11 | 19 | Antibiotic Resistant Bacteria | p. 119-122 |
|  | 20 | Transmission of Infection | p. 123-126 |
| Apr 16 - 18 |  | **Practical Exam 3** |  |

**$ =** Microscope Storage Checks = 10 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**:

|  |  |
| --- | --- |
| **Technical Lab Specialist, TLS:** | **Instructor of Record, IOR:** |
|  | Sarah Rodgers |
| **Email:** | **Email:** [srodgers@irsc.edu](mailto:srodgers@irsc.edu) |
|  | **Office:** N124 (knock at N122) |
|  | **Phone:**772-462-7149 |

The **Instructor of Record** **(IOR)** for this course is Professor Sarah Rodgers. 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)** is 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**. If the issue cannot be resolved, Professor 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 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.

**LAB MANUAL**: *MCB 2010L Health Care Microbiology Lab* Manual– 2nd Edition for IRSC

**LECTURE TEXT**: Microbiology, 4rd edition by Bauman

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

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| --- |
| 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 three 100 point unit Practical exams (300 pts total), Microscope Exam (40

pts), six 10 point Microscope Storage Checks (60 pts total), \*\*\***See ATTENDANCE policy below that may affect the grade\*\*\***

The grades are assigned on the following basis:

A: 90 - 100 B: 80 - 89 C: 70 - 79 D: 60 - 69 F: below 60

The student’s test grades can be viewed at any time on Blackboard, thus the student has continual access to their current academic standing in the course. It is the student’s responsibility to monitor their grade and also to approach the instructor for academic support/suggestions if the student is not earning the grade they desire. **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.

**\*\*\*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.\*\*\***

W = student withdraw by Mon., March 25, 2019 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 will not be considered for students whom were failing prior to the final exam and did not speak with their TLS/IOR about possible solutions to pass the course.

**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. This is 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. Due to increased number of students in the Biology program, 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 IOR (see “Make-up Policy” below) and will be administered the same week as each practical is given on Friday @ Main Campus only.

**OPEN LAB POLICY:** Refer to General Lab Rules handout

**ATTENDANCE:** 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 class ON TIME in order to be counted present; 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; **failure to arrive on time will be marked as Absent.** It is the *student’s responsibility* to notify the instructor at the end of class that they arrived late. Note: **2 late arrivals are considered “Absent”** and will be penalized as such**.**

**Twelve points (3% of your 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 excused absence *per semester*.** For example, if you miss two lab classes duringthe semester and you ended up with an 80 average, then your final average would be a 77 and you would receive a C in the course. This one freebee is supplied for any illness, transportation issue, emergency, vacation/flight etc. and does not require documentation or approval to be utilized, however any absences past the freebee, *regardless of issue,* **will not** be considered excused and will count as a missed class period.

**Alternative Lab Participation (ALP):** If you happen to know you will be missing a lab class, 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 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/) And you will need to contact the alternative lab’s instructor to ask permission if you can attend (students cannot attend if the instructors lab does not have an alternative lab bench seat available). 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.

\**Note for Friday Labs: Lab experiments are set up by week, so if a student happen to miss their Friday lab class, they will not have any opportunities to sit in a later lab class to participate in the experiment.*

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 will 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 is 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 Lab Report.*

<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 the instructor **within 24 hours of the schedule exam time** with a *verifiable emergency*. Students whom miss *both* exam 1 and 2, regardless of reason, will need to withdraw from the course or risk receiving their earned grade (F) reported on their transcript. *Approved* make-up exams are given the same week as the students regularly scheduled practical, on Friday’s @ Main Campus only. Timeframe of the Friday 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, depending on the situation the IOR may assign an “I” or incomplete grade for the course, and 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 third exam, they must contact the instructor **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 final 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.

**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 #\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**