HOUSTON COMMUNITY COLLEGE

Department: Life Sciences (Biology)

MICROBIOLOGY

Spring 2016

Biology 2420. CRN # 91880

Course location and times	Southwest- West Loop Campus Tuesday. 6.00 pm- 9.00 pm. Room 162 Thursday. 6.00 pm- 9.00 pm. Room C222
Course semester credit hours	4 semester credit hours
Course contact hours	3 hours Lectures/ Laboratory = 96 total hours.
Course length	16 weeks
Instruction type	In-person, Lecture –Lab

Instructor	**Dr. RAJESH RAMAKRISHNAN, Ph.D.**
Email address	rajesh.ramakrishnan@hccs.edu
Office location and hours	West Loop Campus, Saturday: 30 minutes before and after class. Otherwise by email.

I.) Course Description:

This is a Core Curriculum Course. This course provides an overview of the microbial world and the techniques to study it. The course material will include a description of basic cell structure, metabolism, nutrition, reproduction, and microbial genetics. Mechanisms of transmission, microbial entry, pathogenesis, prophylaxis, epidemiology, and microbial control of selected human pathogens will be explored. Basic immune defense mechanisms and immunological responses to pathological conditions will be examined. Laboratory exercises will include aseptic technique, microscopy, culture techniques, bacterial morphology determination, staining, and biochemical differentiation. Special emphasis will be placed on topics and applications that relate to humans.

You are spending a good deal of time, energy and money on this course – please, make the most of your investment! It takes approximately **2-3 hours of study time for each hour of class time to master the material**. This class will have about 96 contact hours. **The class and study time necessary to succeed in this class will be close to 300 hours (20 hours per week)!**

II.) Course Prerequisites:

General Biology 1406 is an **absolute prerequisite. NO EXCEPTIONS!!** Must be placed into college-level reading (or take GUST 0342 as a co-requisite) and be placed into college-level writing (or take ENGL 0310 /0349 as a co-requisite). If you have not taken the prerequisite course, your full understanding of the material will be limited and this will affect your grade. **Anatomy and Physiology (A & P) does not replace the required prerequisite and success in A & P does not predict your grade outcome in Microbiology.**

III.) Course Goals:

This course is intended for students majoring in one of the physical sciences or life sciences, engineering, or for students who are pursuing pre-professional programs in medicine, dentistry, nursing, pharmacy, veterinary medicine, or other allied health programs. The course is also beneficial to students who are preparing themselves for higher level science courses in their respective curricula.
Note: This is a NON-MAJORS level microbiology course!! This course might be acceptable for most nursing and allied health schools. It is possible that this course may not transfer to certain healthcare related professional program schools. The student is **strongly advised** to check with these schools regarding the acceptability of BIOL. 2420 before completing this course.

IV.) Biology 2420 Program Student Learning Outcomes (PSLO):

1) To recognize, identify, and describe the structure, function, and significance of microbes.
2) To develop standard and accepted laboratory techniques in the field of Microbiology.
3) To develop attitudes and work habits applicable to the healthcare field.

V.) Course Student Learning Outcomes (SLO):

The following Student Learning Outcomes with their associated assessment criteria are not meant to be all inclusive, and are meant to be used along with all other course learning outcomes and assessment devices, listed under Course Objectives, in the determination of the student's final course grade. Completion of the specific Student Learning Outcomes listed below, at any assessment grading level, **does NOT and will NOT** guarantee the student that final course grade at the end of the semester!

1) The student will recognize and compare the structure and function of microbes (and their respective organelles) including bacteria, fungi, viruses, selected protozoa, and helminthes.
2) The student will explain the process of identification and classification of microbes.
3) The student will explain the clonal selection theory of Adaptive Immunity.
4) The student will demonstrate aseptic technique in the laboratory and an understanding of microbial control.
5) The student will exhibit competence with Microscopy, including the use of the oil- immersion objective lens.
6) The student will develop the habit of reliable attendance by being absent from class **no more than four times per semester**.
7) The student will demonstrate punctuality in class attendance and in the submission of class assignments by the deadline.

V.A.) LECTURE

1) Provide examples of the impact of microorganisms on agriculture, environment, ecosystem, energy, and human health, including biofilms.
2) Identify unique structures, capabilities, and genetic information flow of microorganisms.
3) Compare the life cycles and structures of different types of viruses.
4) Discuss how microscopy has revealed the structure and function of microorganisms.

5) Give examples of the range of metabolic diversity exhibited by microorganisms, impact of metabolic characteristics on growth, and control of growth.
6) Describe the causes and consequences of mutations on microbial evolution and the generation of diversity as well as human impacts on adaptation.
7) Classify interactions of microorganisms on human and non-human hosts as neutral, detrimental, or beneficial.
8) Describe the human immune system and its response to microorganisms and its components.

V. B.) LABORATORY

1) Apply scientific reasoning to investigate questions and utilize scientific tools such as microscopes and laboratory equipment to collect and analyze data.
2) Use critical thinking and scientific problem-solving to make informed decisions in the laboratory.
3) Communicate effectively the results of scientific investigations.
4) Identify unique structures and capabilities of microorganisms.
5) Compare the life cycles of different types of viruses.
6) Discuss how microscopy has revealed the structure and function of microorganisms.
7) Give examples of the range of metabolic diversity exhibited by microorganisms, impact of metabolic characteristics on growth, and control of growth.
8) Classify interactions of microorganisms on human and non-human hosts as neutral, detrimental, or beneficial.

VI.) COURSE OBJECTIVES:

1) To establish an understanding of the major historical events in microbiology and their impact on medical science.
2) To describe basic cell structure, biochemistry, metabolism, nutrition, reproduction, and genetics of microorganisms, with an emphasis on bacteria.
3) To compare and contrast the various types of pathogenic microorganisms, including bacteria, fungi, viruses, protists, and helminths, with an emphasis on their medical significance.
4) To describe various means of microbial control, both *in vivo* and *in vitro*.
5) To demonstrate knowledge of the basic principles of epidemiology.
6) To demonstrate knowledge of the basic principles of immunology.
7) To describe the basics of biotechnology and genetic engineering, and to provide an understanding of the importance of molecular methods in the construction of microbial products for scientific, medical and industrial uses.
8) To compare and contrast the mechanisms of transmission, entry, pathogenesis and prophylaxis of selected human pathogens.
9) To demonstrate skill in aseptic transfer techniques, and discuss the importance of general asepsis.
10) To demonstrate skill in basic microscopy, morphological staining, culture techniques, and biochemical differentiation of selected human pathogens.

VII.) CORE CURRICULUM STATEMENT:

Lecture exams, laboratory practical exams, and class activities will aim to enhance the learning process. This will give the student an opportunity to demonstrate the basic intellectual competencies of reading, writing, speaking, listening, showing critical thinking, and problem solving ability.

VIII.) Course Calendar:

		Spring 2016. Biology 2420. CRN # 91880: Course calender with laboratory information	
Week	**Date**	**Tuesday**	**Thursday**
1	Jan 19- Jan 21	Chp 1	Chp 3
2	Jan 26- Jan 28	Chp 4	Chp5
3	Feb 2- Feb 4	Laboratory exercises 1,2,3	**Expt 1,2,3 report due**; Chp 5
4	Feb 9- Feb 11	Laboratory exercises 4,5,6,10	Chp 6
5	Feb 16- Feb 18	Laboratory exercises 7,8,9; **Read results expt 4,5,6,10**	**Expt 4,5,6,7,8,9,10 report due**; Chp 6
6	Feb 23- **Feb 25**	Chp 7	**Lecture exam 1 (Chps 1-6)**
7	Mar 1- Mar 3	Chp 8	Chp 9
8	**Mar 8**- Mar 10	**Practical Exam 1 (Labs 1-10)**	Chp 10
Spring break (Mar 14- Mar 19)			
9	Mar 22- Mar 24	Chp 11	Chp 12
10	Mar 29- **Mar 31**	Laboratory exercises 11,13,14,21	**Lecture exam 2 (Chps 7-12)**
11	April 5- April 7	Laboratory exercises 15,16,17, **read results expt 11,13,14,21**	**Expt 11,13,14,21 report due;** Chp 13
12	April 12- April 14	Laboratory exercises 19,20; **read results expt15,16,17**	**Expt 15,16,17,19,20 report due**; Chp 14
13	April 19- April 21	Chp 14, Chp 15	Chp 15
14	**April 26**- April 28	**Practical Exam 2 (Labs 11-21, but not 12 or 18)**	Chp 16
15	May 3- **May 5**	Chp 16 and **(Chp18 -only if time permits)**	**Lecture exam 3 (Chps 13-16)**
16	**May 10- May 12**	**Course material review (optional attendance)**	**Comprehensive mandatory class final and comprehensive program final exams (2 back-to-back exams)**

IX.) Instruction Methods:

IX.A.) Lecture: Lecture format may include use of whiteboard, Power Point slides, videos, film clips, photos, or animations. **Assigned textbook chapters should be read prior to class**. Lecture material will correspond to the topics covered in the required textbook. Topics and concepts covered during lecture or included in the assigned reading will be included in exams.

IX.B.) Laboratory: Laboratory sessions will emphasize learning standard microbiological lab techniques. The instructor will demonstrate methods and assist reinforcement of lecture material. Lecture may be included during lab sessions to clarify or detail concepts.

Student Assignments	Students are required to read assigned chapters before lecture and laboratory exercises are scheduled. Unannounced quizzes might be given in lab or lecture.
Student Assessments	Students will be assessed via **3 lecture**, **2 laboratory examinations, 1 term paper** and a **final class comprehensive exam**. **Additionally, there is a required comprehensive Biology program final.** No exam grade will be dropped in this course. **Class grades will not be curved. You own the scores that you earn.**
Instructional Materials	**Textbook:** Talaro & Chess, Barry, ***Foundations in Microbiology***, 9th edition, 2015, McGraw-Hill Publishers.

	Laboratory Manual: Donna S. Wiersema, M.S. & Pramila Sen, Ph.D., Editors, ***Microbiology, Laboratory Manual for Biology 2420***, 5th edition, 2007. **Web resources:** 1) Southwest College Learning Web: Syllabus, Lecture power-points, additional optional readings. 2) Textbook Website: CONNECT- you must purchase a code if you do not buy a new textbook or the ebook.

X.) HCC Policy statements:

HCC Policy Statement: **ADA**	Any student with a documented disability (e.g. physical, learning, psychiatric, vision, hearing, etc.) who needs to arrange reasonable accommodations must contact the Disability Services Office at the respective college at the beginning of each semester. Instructors are authorized to provide only the accommodations requested by the Disability Support Services Office. If you have any special needs or disabilities that may affect your ability to succeed in college classes or participate in any college programs or activities, please contact the DSS office for assistance. **To visit the ADA Web site, please visit www.hccs.edu then click Future students, scroll down the page and click on the words Disability Information.** At Southwest College, contact: **Dr. Becky Hauri** West Loop Campus Houston, Texas 77081 Phone: 713-718-7909, Fax: 713-718-7781, TTY: 713-718-7909
HCC Policy Statement: **ACADEMIC HONESTY**	Students are responsible for conducting themselves with honor and integrity in fulfilling course requirements. Disciplinary proceedings may be initiated by the college system against a student accused of scholastic dishonesty. Penalties can include a grade of "0" or "F" on the particular assignment, failure in the course, academic probation, or even dismissal from the college. Scholastic dishonesty includes, but is not limited to, cheating on a test, plagiarism, and collusion.
HCC Policy Statement: **STUDENT ATTENDANCE, REPEATERS, WITHDRAWLS**	**Attendance** Students are expected to attend classes regularly. Students are responsible for materials covered during their absences, and it is the student's responsibility to consult with instructors for make-up assignments. Instructors check class attendance daily. A student may be dropped from a course for excessive absences after the student has accumulated absences in excess of 12.5% of the hours of instruction (including lecture and

laboratory time). Note that 12.5% is approximately 4 classes or labs for a 4-semester hour course.

Habitual tardiness will not be tolerated. Students are expected to be in attendance for the entirety of the scheduled class and are responsible for completing assignments scheduled during their absence/s. It is the responsibility of each student to amend their professional/personal schedule to meet the class schedule.

If you wish to drop the class, **it is your responsibility** to complete the paperwork and get it to the registration desk or the online system before the deadline **(October, 30, 2015)**. **I do not drop students for lack of attendance.**

Repeaters

Students who repeat a course for a third or more times may soon face significant tuition/fee increases at HCC and other Texas public colleges and universities. Please ask your instructor / counselor about opportunities for tutoring / other assistance prior to considering course withdrawal or if you are not receiving passing grades.

Withdrawals

Withdrawal from the course after the official day of record (see current catalog) will result in a final grade of "W" on the student transcript and no credit will be awarded. It is the student's responsibility to initiate and complete a withdrawal from any course. Abandoning the course or failing to formally drop, will result in a grade being given based on the work completed for the entire course (including missed exams). In case of prolonged absences the instructor should be notified. The student must go through proper channels in order to officially withdraw from a course; non-attendance does not automatically withdraw one from any course. **THIS MUST BE DONE PRIOR TO THE LAST DAY TO ADMINISTRATIVELY DROP A COURSE (April, 5, 2016) TO RECEIVE A "W" ON YOUR TRANSCRIPT. I WILL NO LONGER BE ABLE TO ASSIGN A "W" FOR YOU AFTER THAT DATE!!! YOU WILL RECEIVE THE GRADE YOU EARN, WITH NO EXCEPTIONS**!!! I am under no obligation to withdraw you from this course if you stop attending!! If a student fails to officially withdraw, he or she may be issued the grade of **"FX"** at the end of the semester for non attendance. Exceptions to this policy will be made only under extraordinary circumstances.

The State of Texas has begun to impose penalties on students who drop courses excessively. For example, if you repeat the same course more than twice, you have to pay extra tuition. Beginning in fall 2007, the Texas Legislature passed a law limiting first time entering freshmen to no more than SIX total course withdrawals throughout their educational career in obtaining a certificate and/or degree.

	Receiving a "W" in a course may affect the status of your student Visa. Once a W is given for the course, it will not be changed to an F because of the visa consideration. Please contact the International Student Office at 713-718-8520 if you have any questions about your visa status and other transfer issues
HCC Policy statement: SEXUAL HARASSMENT	It is a violation of HCC policy for an employee, agent, or student of the college to engage in sexual harassment as defined in the EEOC guidelines (EEO/AA Compliance Handbook 47). **TITLE IX OF THE EDUCATION AMENDMENTS OF 1972, 20 U.S.C. A§ 1681 ET. SEQ.** Title IX of the Education Amendments of 1972 requires that institutions have policies and procedures that protect students' rights with regard to sex/gender discrimination. Information regarding these rights are on the HCC website under Students-Anti-discrimination. Students who are pregnant and require accommodations should contact any of the ADA Counselors for assistance. It is important that every student understands and conforms to respectful behavior while at HCC. Sexual misconduct is not condoned and will be addressed promptly. Know your rights and how to avoid these difficult situations. Log in to: www.edurisksolutions.org . Sign in using your HCC student e-mail account, then go to the button at the top right that says **Login** and enter your student number.
HCC Policy statement: **SAFE AND SECURE LEARNING ENVIRONMENT**	It is the policy of HCC to provide a safe and secure environment within which learning can take place effectively. Accordingly, disruptive, threatening, or violent behavior in the classroom will not be tolerated. Disruptive, threatening, or violent individuals will be asked to leave the classroom for that day. Failure to comply with this request may lead to removal and/or arrest by the police. This is in addition to any college disciplinary action to which the individual might be liable.
HCC Policy statement: **EGLS3 -- EVALUATION FOR GREATER LEARNING STUDENT SURVEY SYSTEM**	At Houston Community College, during a designated time, you will be asked to answer a short online survey of research-based questions related to instruction. **The anonymous results of the survey will be made available to your professors and division chairs for continual improvement of instruction only after your grades are officially posted.** Look for the survey as part of the Houston Community College Student System online near the end of the term.

XI.) Instructor Requirements:

1) Students should be on time for class and be prepared (having read and studied the assignments) with required materials including textbook and lab manual. Breaks will be given; any abuse of break time will be noted.

2) No eating or drinking in labs or classrooms (water bottles or closed containers are permitted in the classroom only).
3) **No electronic devices are permitted to be on and in use**. If family/personal situations require you to be available via phone, place it on vibrate and wait until break to respond or quietly exit to take the call outside.
4) Taking calls, texting, etc. during class is disruptive and discourteous to instructor and classmates.
5) **All exams and scantrons are to be returned to the instructor at the end of the post exam review.**
6) **Exams are not to be copied**.
7) If you have a condition which will affect performance of a lab or assignment, please inform the instructor. We will be handling infectious, living, opportunistic pathogens. **All rules of the college apply**. Know the safety rules as applied to the lab component of this course. Repeat violations of safety rules endanger the entire class and will result in a deduction of points from your grade.
8) The use of recording devices, including camera phones and tape recorders, is prohibited in classrooms, laboratories, faculty offices, and other locations where instruction, tutoring or testing occurs. Students with disabilities who need to use a recording device as a reasonable accommodation should contact the Office for Students with Disabilities for information regarding reasonable accommodations.
9) **Testing procedures**: Come prepared to take the test. You will need a scantron **(882-E)** for most exams, a #2 pencil, and a smudge-proof eraser.
10) Be sure to arrive early for your examinations. There are time limits for exams and if you arrive late, you will not be given additional time. Once the exam has begun you will not be allowed to leave the room, so take care of restroom needs before we begin.
11) Do not plan to leave after a test or schedule appointments, as we might continue with class or lab.
12) **You will need to purchase a box of coloring pencils for preparing your lab reports**.
13) **NO CELL PHONES OR TEXT MESSAGING DEVICES ARE ALLOWED IN USE IN CLASS AT ANY TIME! AUDIBLE CELL PHONE RINGING MAY RESULT IN YOUR REMOVAL FROM CLASS THAT DAY! I RESERVE THE RIGHT TO REMOVE FROM USE ANY ELECTRONIC DEVICE BEING USED FOR NON-CLASS PURPOSES. THE ACTUAL OR POSSIBLE USE OF ANY UNAUTHORIZED ELECTRONIC DEVICE DURING EXAMINATIONS OR DURING POST EXAM TEST REVIEW SESSIONS IS CHEATING AND WILL RESULT IN COURSE FAILURE!!**
14) **ELECTRONIC RECORDING OF THE CLASS (LECTURE AND LABS) IN AUDIO AND/OR VIDEO FORMAT EXPRESSLY PROHIBITED. STUDENTS FOUND ELECTRONICALLY RECORDING THE CLASS AND LABS MAY BE SUBJECT TO IMMEDIATE COURSE FAILURE. STUDENTS MAY TAKE NOTES IN THEIR BOOKS OR ON THE PRINTED POWER POINT SLIDES.**

XII.) Department Guidelines:

Students are expected to conduct themselves as adults. This includes courteous and respectful behavior towards instructor and classmates. Disruptive behavior or any behavior that interferes with any educational activity being performed by the instructor will not be allowed. Additionally, no student may interfere with his/her fellow students' right to pursue their academic goals to the fullest in an atmosphere appropriate to a community of scholars. Disruptive behavior may result in removal from the class.

XII. A.) Lab policy:

1) Lab safety rules are stated in lab manual. Lab rules and regulations will be discussed during the first lab and must be followed at all times. The instructor is not responsible for injury to the student or damage to the lab or equipment due to violation of lab safety rules.

2) Each student is responsible for cleaning up after labs; this includes disinfection of table surfaces, microscope lens cleaning, prepared slide cleaning, glassware washing (no, cleanup is not covered by your lab fees). Cleaned prepared specimen slides are to be replaced in the labeled boxes in the correct order and correct format. **No one may leave until the laboratory is clean and the instructor has released the class. This is a team effort.**
3) Hand washing is required before leaving the lab for any reason.
4) Lab reports are due the next lab session unless we must wait until the next lab session to read results. Then the lab reports will be due the subsequent lab session.
5) There are no make-up lab practical exams; **at the discretion of the instructor** and with proper medical excuse (or other) from the student, a written exam may be administered.

XIII.) Instructor Grading Criteria:

Failure to take a test (lab or lecture) will result in a "0" for the missed exam. A test may be made up (lecture, no lab practical) with proper documentation from the student (Hospital bills, jury duty, arrest warrants etc.). Only one make-up exam per semester is allowed (with proper documentation) and must be arranged with instructor ASAP. There will be no makeup exams given for laboratory practical. A firm grade of zero is recorded for a missed laboratory practical exam**, without recourse to the final exam**.
In this course, grades are not "curved". Individual assignments or papers are not accepted in order to earn additional points. All students will have opportunities to improve point scores. Extra credit may be earned on each regular lecture exam by answering the "bonus points" question, and on laboratory practical exams by lab report extra credit.

XIV.) Grade Calculation

Exam type	Score
Lecture Exam 1	100
Lecture Exam 2	100
Lecture Exam 3	100
Comprehensive Lecture Final	100
Comprehensive Program Final	100
Lab Exam 1	100
Lab Exam 2	100

1) Up to 19 points for laboratory reports, as extra credit for the practical exams.

* All seven test scores will carry equal weight. **Course grade will be the average of all seven test scores**. For example:

3 regular exams + 2 practical exams + lab report credit + class final exam + program final exam = 7 scores

XV.) HCC grading scale:

HCC Grading Scale	**A**	**90-100%**
	B	**80-89%**
	C	**70-79%**
	D	**60-69%**
	F	**less than 60% (attended class and earned the grade)**
	FX	**Stopped attending class. This is a failing grade which may result in the student having to rapidly repay certain types of government student loans.**
	IF	**Was given an I and did not finish the required work (automatic after 6 months).**

XVI.) Examination format:

1) Lecture exams will consist of multiple choice and/or essay questions. They will cover the material we cover in class as well as assigned reading, and may be comprehensive to include previous material.

2) Lab exams will cover the material we cover in labs (but information sometimes overlaps with lecture) and may have a written as well as practical component.

3) Exams will not be permanently returned to the student after testing.

4) Laboratory reports will be collected and, **if acceptable**, will be issued a completion value of **one point/ lab exercise**. These completion points will be added as extra credit to the scores earned on their respective practical exams.

5) Lab reports are due the next laboratory session after the laboratory exercise, **WITHIN THE FIRST FIVE MINUTES OF SCHEDULED CLASS** or upon a due date announced by the instructor. **AT ANY LATER TIME**, the laboratory exercise(s) will be refused, and will receive no completion credit. Absence upon due date is not a valid excuse for late laboratory exercises.

6) All exam sheets and Scantron forms will be collected as a permanent record of the student's performance – **no exam material will be kept by the student**.

7) The comprehensive final is mandatory. Failure to take the comprehensive final will result in the firm course grade of "F", regardless of the student's course average from other exam events.

NOTE: The **Instructor reserves the right to modify this syllabus should circumstances arise during the semester and with adequate notification to the students**. This syllabus does not constitute a contract between the instructor or HCC, and the student. The provisions listed above may be changed at any time,

either orally or by written notification. However, examination and grading policies are firm for any given semester, unless extraordinary or emergency circumstances occur.

NO CELL PHONES OR TEXT MESSAGING DEVICES ARE ALLOWED IN USE IN CLASS AT ANY TIME! AUDIBLE CELL PHONE RINGING MAY RESULT IN YOUR REMOVAL FROM CLASS THAT DAY! I RESERVE THE RIGHT TO REMOVE FROM USE ANY ELECTRONIC DEVICE BEING USED FOR NON-CLASS PURPOSES. THE ACTUAL OR POSSIBLE USE OF ANY UNAUTHORIZED ELECTRONIC DEVICE DURING EXAMINATIONS OR DURING POST EXAM TEST REVIEW SESSIONS IS CHEATING AND WILL RESULT IN COURSE FAILURE!!

Assessment Rubrics
Microbiology 2420

Performance Factors	Rating Scale				
	F	D	C	B	A
1. The student will recognize and compare the structure and function of microbes (and their respective organelles) including bacteria, fungi, viruses, selected Protozoa, and Helminthes. **PSLO #1**	Unable to demonstrate knowledge of structure and function of most microbes(and organelles) including bacteria, fungi, viruses, selected Protozoa, and Helminthes.	Occasionally able to demonstrate knowledge of structure and function of a few microbes(and organelles) including bacteria, fungi, viruses, selected Protozoa, and Helminthes	Occasionally able to demonstrate knowledge of structure and function of most microbes(and organelles) including bacteria, fungi, viruses, selected Protozoa, and Helminthes	Consistently able to demonstrate knowledge of structure and function of most microbes (and organelles) including bacteria, fungi, viruses, selected Protozoa, and Helminthes.	Consistently able to demonstrate knowledge of structure and function of all microbes (and organelles) including bacteria, fungi, viruses, selected Protozoa, and Helminthes.
2. The student will explain the process of identification and classification of microbes. **PSLO #1**	Unable to demonstrate and apply knowledge of the five "I's", standard methods of identification, or use of culture media.	Rarely able to demonstrate and apply knowledge of the five "I's", standard methods of identification, or use of culture media.	Able to sometimes demonstrate and apply knowledge of the five "I's", standard methods of identification, or use of culture media.	Able to consistently demonstrate and sometimes apply knowledge of the five "I's", standard methods of identification, or use of culture media.	Able to consistently demonstrate and apply knowledge of the five "I's", standard methods of identification, and use of culture media.
3. The student will be able to explain Clonal Selection Theory. **PSLO #1**	Unable to explain the origin and development of T and B lymphocytes, specificity and diversity of receptors on T and B lymphocytes, the origin of immune tolerance, and neither major stage of Clonal Selection Theory.	Unable to fully explain the origin and development of T and B lymphocytes, specificity and diversity of receptors on T and B lymphocytes, the origin of immune tolerance, and neither major stage of Clonal Selection Theory.	Able to consistently explain the origin and development of T and B lymphocytes, specificity and diversity of receptors on T and B lymphocytes, the origin of immune tolerance, and neither major stage of Clonal Selection Theory.	Able to consistently explain the origin and development of T and B lymphocytes, specificity and diversity of receptors on T and B lymphocytes, the origin of immune tolerance, and one major stage of Clonal Selection Theory.	Able to consistently explain the origin and development of T and B lymphocytes, specificity and diversity of receptors on T and B lymphocytes, the origin of immune tolerance, and two major stages of Clonal Selection Theory.

Performance Factors	Rating Scale				
	F	D	C	B	A
4. The student will demonstrate aseptic technique in the laboratory and an understanding of microbial control. **PSLO #2**	Consistently disregards aseptic technique in performing lab exercises and consistently disregards rules of the microbiology lab regarding disinfection, food, and hand washing.	Consistently disregards aseptic technique in performing lab exercises and occasionally fails to follow the rules of the microbiology lab regarding disinfection, food, and hand washing.	Occasionally fails to demonstrate aseptic technique in performing lab exercises and occasionally fails to follow the rules of the microbiology lab regarding disinfection, food, and hand washing.	Able to consistently demonstrate aseptic technique in performing lab exercises and occasionally fails to follow the rules of the microbiology lab regarding disinfection, food, and hand washing.	Able to consistently demonstrate aseptic technique in performing lab exercises and consistently follow the rules of the microbiology lab regarding disinfection, food, and hand washing.
5. The student will exhibit competence with Microscopy, including use of the oil immersion lens. **PSLO #2**	Consistently unable to locate the microbe on the microscope slide and consistently unable to focus using oil immersion lens or other objective without instructor's help.	Occasionally able to locate the microbe on the microscope slide, but unable to focus using oil immersion lens or other objective without instructor's help.	Occasionally able to locate the microbe on the microscope slide, and occasionally able to focus using oil immersion lens or other objective without instructor's help.	Consistently able to locate the microbe on the microscope slide and sometimes focus using oil immersion lens or other objective without instructor's help.	Consistently able to locate the microbe on the microscope slide and consistently focus using oil immersion lens or other objective without instructor's help.
6. The student will develop the habit of reliable attendance by being absent from class no more than four times per semester. **PSLO #3**	Is absent frequently enough to interfere with instruction and the completion of the course objectives, and/or is frequently not where he/she is expected to be. Infracts the HCC attendance policies.	When absent, is never aware of the schedule for the day upon return, and must be reminded or encouraged to complete objectives missed during the absence. Is occasionally not where he/she is expected to be.	When absent, is only occasionally unaware of the schedule for the day upon return. Completes objectives missed during the absence only with the help of the instructor and/or classmates, and is where he/she is expected to be at all times.	When absent, independently or with little help completes objectives missed during the absence. Always aware of the schedule for the day, and is where he/she is expected to be at all times.	Is never absent, always aware of the schedule for the day, and is where he/she is expected to be at all times. Consistently and willingly follows HCC attendance policies without being reminded.
7. The student will demonstrate punctuality in class attendance and in the submission of class assignments by the deadline**.** **PSLO #3**	Is frequently late for class enough to interfere with class instruction. Submits assignments two or more weeks late, or ignores assignments.	Is frequently late for class enough to interfere with class instruction or submits assignments no more than one week late.	Is occasionally late for class and occasionally late for assignment turn-in. Submits assignments no more than one day late.	Is consistently on time for class and rarely late for assignment turn-in. Always submits assignments on the due date.	Is consistently on time for class and for assignment turn-in. Always submits assignments on the due date.

Biology 2420

Acknowledgement Page

I acknowledge that I have read the syllabus for Biology 2420 and understand the effort and time commitment necessary to succeed in this Science - Medical Professional Class (Approximately 300 hours, 20 hours/week). I will prepare for class and perform all exercises and assessments on time and to the BEST of my ability. I understand that I will get the grade I earn, based on my competence in Microbiology, as determined by my performance on my work and the Departmental Final Exam. I will conduct myself in an ethical and scientific manner and be courteous and respectful towards instructor and classmates. I further acknowledge that I am preparing for a medical career and that there will be no exceptions.

Signature _____

Print name _____

Email Address _____

Current Phone # _____

Student's exam scorecard

	Student Name								
	Spring 2016	CRN 91880							
	Grade 1	Grade 2	Grade 3	Practical 1	Practical 2	Class Final	Program Final	Term Average	Letter grade
Scored									

Grading Scheme	
A	100-90
B	89-80
C	79-70
D	69-60
F	59 and less