ANGELO STATE UNIVERSITY

BSN

NUR 2411
Microbiology for Healthcare Professionals
Spring 2018

Jacqueline Brown, M.S., PhD, RN
**Course Title:** Elementary Microbiology (3-0-1)

**Course Number:** NUR 2411

**Prerequisite:** Anatomy and/or Physiology

**Course Description:**
This course focuses on building knowledge in infectious microbiology for the nursing student. It includes lecture and laboratory formatted instruction designed to educate in core concepts in microbiology and application in a clinical setting.

**Course Methods:**
A variety of learning modalities will be employed in the course, including those involving individual as well as group efforts. Specifically, these learning modalities will include individual reading and contribution to discussion within the context of case studies, journal articles and current topics in infectious diseases.

**Course Objectives:** Upon completion of the course, the student will be able to:

1. To demonstrate knowledge in discerning signs and symptoms of medically relevant infections due to viruses, protozoa, bacteria and fungi in order to apply knowledge in clinical settings
2. To develop individualized care plans for diseases resulting from infectious processes including pathogenesis, diagnosis, signs and symptoms, transmission, treatment modalities including antibiotic resistance issues, patient education
3. To demonstrate understanding of the methods of infectious transmission and the means by which these are controlled, including those related to hospital settings (nosocomial)
4. To demonstrate knowledge of the nature of antimicrobial resistance and to incorporate this knowledge within the context of providing appropriate healthcare
5. To demonstrate knowledge in administering quality care in the context of safe handling of infectious materials/patients in order to minimize risk of transmission

**IDEA Objectives**
- Gaining a basic understanding of the subject (e.g., factual knowledge, methods, principles, generalizations, theories)
- learning to apply course material (to improve thinking, problem solving and decision)
- learning how to find, evaluate and use resources to explore a topic in depth
Topical Outline:

UNIT ONE

Chapter Three/Cell Structure and Function (January 17, 22)

Objectives:

1. To differentially distinguish prokaryotic from eukaryotic features
2. To identify the clinical implications regarding pathogenicity and treatment as it relates to cell wall type (gram +, gram -, acid fast)
3. To understand the function of the cytoplasmic membrane regarding selective permeability and apply this knowledge relative the implications to treatment/infection control

Chapter Four (January 17, 22)- we will only cover the gram stain

Chapter Eleven/Prokaryotes (January 22, 24)

Objective:

1. To identify significant beneficial or detrimental effects of pathogenic bacteria including:
   a. low G+C gram positive bacteria
   b. high G+C gram positive bacteria
   c. gram negative bacteria
   d. other gram negative bacteria

Chapter Twelve/Eukaryotes (Protozoa, Fungi and Helminthes of Medical Importance) (January 29)

Objective:

1. To identify significant beneficial or detrimental effects of pathogenic protozoa, fungi and helminthes

Chapter Thirteen/Viruses and Prions (January 31)

Objectives:

1. To understand and apply information as it relates to the mechanism by which viruses are specific for their host cells
2. To understand the differences between, and the implications of, lysogenic replication vs lytic replication of viruses
3. To understand the mechanisms of viral induced cancers through lysogeny and appropriately apply the terms neoplasia, tumor, benign, malignant, cancer and metastasis as it relates to pathology caused by DNA and RNA viruses
4. To identify the differences between prions and viruses, the healthcare implications of prion pathology and the prevention of prion disease
EXAM ONE – chapters 3, 4-only gram stain, 11, 12 & 13 (February 5)

UNIT TWO

Chapter Five/Microbial Metabolism (February 7)

Objectives:
1. To understand the basic similarities/differences between eukaryotic and prokaryotic metabolism and its application to diagnostic tests
2. To understand the nature of aerobic and anaerobic respiration and the relationship between these processes and infections
3. To understand the fundamental importance and difference between fermentation and respiration and the implications of each with regard to diagnostic measures

Chapter Six/Microbial Nutrition and Growth (February 12)

Objectives:
1. To distinguish among anaerobes, aerobes, aerotolerant anaerobes, facultative anaerobes and microaerophiles/the association of toxic oxygen intermediates and bacterial protective mechanisms
2. To understand and apply knowledge concerning extremes of physical factors (temperature, pH and osmotic and hydrostatic pressure) and their effect on microbial growth.
3. To understand quorum sensing and formation of biofilms and to apply this knowledge to the management and prevention of biofilm related disease
4. To apply methods for collecting clinical specimens

UNIT THREE

Chapter Nine/Controlling Microbial Growth in Environment (February 14)

Objectives:
1. To identify the effectiveness of sterilization, disinfection, antisepsis, degemring, sanitization, and pasteurization/to distinguish the nature by which effects of static versus-cidal agents can be effective in controlling microbial growth
2. To identify the three most resistant groups of microbes and understand how environmental conditions can influence the effectiveness of antimicrobial agents
3. To apply information regarding the features of antimicrobial chemicals relative to their use in treating infections/to understand the positive and negative aspects of each and the resulting health implication
**Chapter Ten/Antimicrobial Therapy (February 19)**

Objectives

1. To understand the principle of selective toxicity and how to maximize effectiveness of antimicrobial therapy through careful organism identification and knowledge of drug mechanism of action
2. To apply the basic tenets of appropriate antimicrobial therapy including appropriate drug choice, management of patient compliance and minimization of resistance development.

**Exam Two—chapters 5, 6, 9 (February 21)-chapter ten will count towards exam grade using an alternate project format. The project will count as a separate exam (ie exam three)**

**UNIT FOUR**

**Chapter Fourteen/Infection, Infectious Diseases and Epidemiology (February 26, 28)**

Objectives:

1. To identify the importance of normal microbiota and the conditions which create opportunities for normal microbiota to cause disease.
2. To identify the nature by which infectious agents are transmitted, including contact, vehicle, vector, droplet, airborne, mechanical and biological transmission/ how disease transmission can be prevented
3. To distinguish among acute, subacute, chronic and latent diseases in terms of characteristics, onset of symptoms and overall implications to healthcare
4. To learn and apply information regarding the factors that influence the development of nosocomial infections /how they can be prevented.

**Chapter Fifteen/Innate Immunity (March 5, 7)-Spring Break is March 12 through 16**

Objectives:

1. To understand the means by which the human body mounts a protective front against an infectious particle
2. To understand the benefits and possible negative implications of the inflammatory process

**Chapter Sixteen/Adaptive Immunity (March 19, 21)**

Objectives:

1. To understand and apply knowledge regarding adaptive immunity and how this differs from innate immunity
2. To distinguish the role of humoral and cell mediated responses relative to specific types of infections
3. To understand the importance of primary versus secondary humoral responses and relative to immunizations/vaccines
4. To understand the difference between active versus passive acquired immunity and naturally acquired versus artificially acquired immunity

Chapter Seventeen/Immunization and Immune Testing (March 26)

Objectives:
1. To apply information regarding the risks/benefits of routine vaccination in terms of contact immunity and herd immunity.
2. To identify the advantages and disadvantages of active immunization and passive immunotherapy

Chapter Eighteen/AIDS and other Immune Disorders (March 28)

Objectives:
1. To recognize the difference between and to apply information regarding the four types of hypersensitivity as it relates to specific immune disorders
2. To understand the implications of suppressed immunity relative to diseases such as AIDS
3. To identify the criterion that define AIDS, its diagnosis, its treatment and its prevention/list four behaviors that increase the risk of infection with HIV

Exam Three-chapters 14, 15, 16, 17 & 18 (April 2)

UNIT FIVE

Chapter Nineteen/Diseases of Skin and Wounds (April 4, 9)

Objectives:
1. To list the diseases, recognize the signs/symptoms, understand the pathogenic mechanisms of the etiologic agent as well as the protective actions taken by the host, and describe the means by which the disease can be transmitted, treated and prevented.

Chapter Twenty Two/Diseases of the Respiratory System (April 11, 16)

Objective:
1. To list the diseases, recognize the signs/symptoms, understand the pathogenic mechanisms of the etiologic agent as well as the protective actions taken by the host, and describe the means by which the disease can be transmitted, treated and prevented.
Chapter Twenty Three/Diseases of the Digestive System (April 18, 23)

Objective:
1. To list the diseases, recognize the signs/symptoms, understand the pathogenic mechanisms of the etiologic agent as well as the protective actions taken by the host, and describe the means by which the disease can be transmitted, treated and prevented.

Chapter Twenty Four/Diseases of the Urinary and Reproductive System (April 23, 25)

Objective:
1. To list the diseases, recognize the signs/symptoms, understand the pathogenic mechanisms of the etiologic agent as well as the protective actions taken by the host, and describe the means by which the disease can be transmitted, treated and prevented.

Chapter Twenty/Diseases of Nervous System and Eyes (April 30, May 2)

Objective:
1. To list the diseases, recognize the signs/symptoms, understand the pathogenic mechanisms of the etiologic agent as well as the protective actions taken by the host, and describe the means by which the disease can be transmitted, treated and prevented.

Chapter Twenty One/Diseases of Cardiovascular System & Systemic Diseases (May 2)

Objective:
1. To list the diseases, recognize the signs/symptoms, understand the pathogenic mechanisms of the etiologic agent as well as the protective actions taken by the host, and describe the means by which the disease can be transmitted, treated and prevented.

Final Exam (not comprehensive)-covers chapters 19, 20, 21, 22, 23, & 24) –May 7 (8-10 AM)

LAB Schedule
01Z first session 2/16, 2/17
02Z first session 2/23, 2/24
03Z first session 3/1, 3/2
01Z second session
3/23, 3/24
02Z second session
3/30, 3/31- change to 4/13, 4/14
03Z second session
4/6, 4/7

Teaching Methods/ Strategies:

This course will be taught utilizing a classroom format. Laboratories are mandatory for both lecture and on line formatted versions of this course and require campus attendance.

Classroom:

Individual and group learning modalities
Case Studies
Combination of student directed learning vs instructor directed learning
Written assignments
Laboratory
Journal Article Review (emerging infections/antimicrobial resistance)
Development of concept maps/care plan maps relating infectious disease processes to clinical application
Examinations

Evaluation: Course grades will be dependent upon meeting the learning objectives and completing activities of the course as follows:

Classroom:

Examinations  (3 plus one poster session)  70%
Assignments (case studies, review questions) 15%
Laboratory 15%

A = 90-100%
B = 80-90%
C = 70-79%
Anything below 70 is failing grade

Required Textbooks:

Bauman, R. W., Microbiology with Diseases by Body System, Third Edition

Microbiology Laboratories for the Nursing Student (Symbiosis-the Pearson custom library for the biological sciences)
Cowan, Microbe Files-case studies in microbiology

**Testing:**
Evaluation of student learning in this course may take a variety of forms, including in classroom testing or individual/group mini projects. Cell phones must be left at the front of the classroom as well as all other personal belongings. I will make available early start times for students who wish to have more time on exams. Officially all exams start at 8 AM and early testers will begin at 7:30. No one will be admitted to the classroom after 7:30 for early testers and anyone who is a late arrival to an 8 AM start time will have points deducted from the earned exam grade. It is important to arrive on time so that there are no disruptions to students who are working on their exams. 10 points will be deducted if a student is not in their seat ready to start by 8 AM. One additional point will be deducted for every 5 minutes thereafter for late arrival.

Make up exams are difficult to schedule. If you must be absent from an exam due to illness, personal emergency etc, you must notify me before test start time. Any make up exam that is deemed appropriate to administer can take an alternate format. It is strongly encouraged that students make every attempt to take the exam on the date it is scheduled. Again, communication with me is essential and this communication cannot take place at a time after the exam has already taken place. When an exam is allowed for makeup purpose, it will be scheduled at the instructor’s convenience. The instructor will make every attempt to re-schedule a time that works well for the student. However if there are more than one student in this situation, both students will be scheduled at the same time/date.

**Laboratories:**
All laboratories are mandatory. Each student is required to attend two 2-day weekend labs, for a total of 4 days. They cannot be made up. If there is an issue in attending a lab session for which you have signed up, you must come and speak with me about a resolution. Lab manuals are required for this course.

**General Policies Related to the Course:**
All students are required to follow the policies and procedures presented in the following documents:

- ASU Graduate Catalog located on the ASU website [https://www.angelo.edu/catalogs/](https://www.angelo.edu/catalogs/)
- University Undergraduate Nursing Handbook, located on the Nursing website: [http://www.angelo.edu/content/files/19304-undergraduatestudenthandbook20132014pdf](http://www.angelo.edu/content/files/19304-undergraduatestudenthandbook20132014pdf).
STUDENT RESPONSIBILITY & ATTENDANCE
In order to complete this course successfully, you do have to participate in all course activities, including assignments, discussions in class, quizzes, exams and projects. Students are expected to engage in course activities and submit work by due dates and times.

Homework policy: All work must be turned in on the specified due date. Most of the time the homework will be submitted to assignment links in blackboard. I will announce through blackboard any deviation from this practice. Homework is assigned well in advance of a due date. Since most of the assignments are submitted through blackboard there should be very few reasons that justify late submissions.

Late homework policy: For every class day that an assignment is late, 20 points will be deducted from earned grade. If I receive an email from you prior to missing class, and an assignment was due to be turned into class as opposed to submission to blackboard, you will be allowed the next class date or Friday of the week you missed class to get the assignment turned in.

Missing assignments due to absence:
If you must miss class, please email instructor in advance of class that will be missed. If email is received, any work that was missed can be made up. However it is the student’s responsibility to stay on top of missed work, not the instructor. Additionally, for planning purposes, this class will probably require a minimum of 3-6 study hours per week on average.

COMMUNICATION
Faculty will respond to email and/or telephone messages within 24 hours during working hours Monday through Friday. Weekend messages may not be returned until Monday although reasonable attempt will be made to accommodate learning during this time.

Written communication via email: All private communication will be done exclusively through your ASU email address. Check frequently for announcements and policy changes.

Instructor communicates exclusively through blackboard email and announcements outside of face to face classroom communication. Instructor also follows up in announcement format to all students reminders of due dates, assignments, etc.

Instructor office hours include:
Monday through Thursday 9:30 to 11:00. Email notification of intent for conference or visit is preferable to ensure responsible scheduling. 
[Jacqueline.brown@angelo.edu]
Instructor office: Vincent 276
Instructor office phone number: 325-486-6864

**ACADEMIC INTEGRITY**

Academic honesty is expected on all work. Students are expected to maintain complete honesty and integrity in their educational experiences. Any student found guilty of any form of dishonesty in academic work is subject of disciplinary action and possible expulsion from ASU. All codes and policies are set forth in the University Student Handbook of Angelo State University [http://www.angelo.edu/student-handbook/] as well as the Department of Nursing Undergraduate Student Handbook [http://www.angelo.edu/dept/nursing/handbook/index.html].

**PLAGIARISM**

Plagiarism at ASU is a serious topic. The Angelo State University’s Honor Code gives specific details on plagiarism and what it encompasses. Plagiarism is the action or practice of taking someone else's work, idea, etc., and passing it off as one's own. Plagiarism is literary theft.

In your discussions and/or your papers, it is unacceptable to copy word for word without quotation marks and the source of the quotation. We use the *APA Style Manual of the American Psychological Association* as a guide for all writing assignments. Quotes should be used sparingly. It is expected that you will summarize or paraphrase ideas giving appropriate credit to the source both in the body of your paper and the reference list. Papers are subject to be evaluated for originality via Bb Safe Assignment or Turnitin. Resources to help you understand this policy better are available at the ASU Writing Center [http://www.angelo.edu/dept/writing_center/academic_honesty.php].

**STUDENTS WITH DISABILITIES**

1. “Angelo State University is committed to the principle that no qualified individual with a disability shall, on the basis of disability, be excluded from participation in or be denied the benefits of the services, programs, or activities of the university, or be subjected to discrimination by the university, as provided by the Americans with Disabilities Act of 1990 (ADA), the Americans with Disabilities Act Amendments Act of 2008 (ADAAA), and subsequent legislation.”
2. “Student Contact: The Student Life Office is the designated campus department charged with the responsibility of reviewing and authorizing requests for reasonable accommodations based on a disability, and it is the student’s responsibility to initiate such a request by contacting the Student Life Office, Room 112 University Center, at (325) 942-2191 or (325) 942-2126 (TDD/FAX) or by email at Student.Life@angelo.edu to begin the process.”

Reasonable accommodations will be made for students determined to be disabled or who have documented disabilities.

INCOMPLETE GRADE POLICY (OP 10.11 Grading Procedures)
It is policy that incomplete grades be reserved for student illness or personal misfortune. Please contact faculty if you have serious illness or a personal misfortune that would keep you from completing course work. Documentation may be required.

STUDENT ABSENCE FOR OBSERVANCE OF RELIGIOUS HOLY DAYS
1. “A student who intends to observe a religious holy day should make that intention known in writing to the instructor prior to the absence.” Please see ASU Operating Policy 10.19.

COPYRIGHT POLICY
Students officially enrolled in this course should make only one printed copy of the given articles and/or chapters. You are expressly prohibited from distributing or reproducing any portion of course readings in printed or electronic form without written permission from the copyright holders or publishers.

SYLLABUS CHANGES
The faculty member reserves the option to make changes as necessary to this syllabus and the course content. If changes become necessary during this course, the faculty will notify students of such changes by email, course announcements and/or via a discussion board announcement. It is the student’s responsibility to look for such communications about the course on a daily basis.

COURSE EVALUATION
Students are provided the opportunity, and are strongly encouraged to participate in a course evaluation at the end of the semester. Areas on the IDEA evaluation include:

- gaining factual knowledge
- learning to apply course material (to improve thinking, problem solving and decision)
- acquiring an interest in learning more by asking questions and seeking answers
- learning how to find and use resources for answering questions and solving problems
- developing skill in expressing oneself orally and in writing
- learning to analyze and critically evaluate ideas, arguments and points of view