Course Title: MOD1-HON205G-Applied Microbiology
Credits: 3.00
Course Description: A survey of microbiology, covering bacteria, viruses, fungi, and protozoa. Students are introduced to cellular structure, growth, protein synthesis, and replication, and learn the role of microorganisms in human disease, the stages of infection, and diagnosis. The role and action of antibiotics, sterilization, and antimicrobials are also covered.
Learning Objectives:
A: Students will be able to answer the Study Questions (below).
B: Student will be able to demonstrate thorough knowledge of the Clinical Skills required for this course (below).
C: Student will demonstrate thorough knowledge of the MANA Core Competencies for Midwives required for this course (below).
D: Students will be able to demonstrate knowledge of any new information in the area of study.
Learning Activities:
I. Student Reads required texts.
II. Student Completes study questions.
III. Preceptor elaborates on study questions.
IV. Clinical Skills and Core Competencies training consists of the following (may take place at clinical visits):

1. Preceptor Explanation of	Safe, evidence-based midwifery care for the individual Clinical Skills and Core Competencies including etiology, sequelae, appropriate management and follow-up for the individual patient, appropriate times and reasons for consult and referral, access to relevant resources and information, complete, thorough and timely record keeping, appropriate, professional, and compassionate management of every task involved, receptiveness and responsiveness to patient's concerns. The Explanation will include a discussion of midwifery decisions and actions as they relate to possible outcomes and their wider impact, based on the Midwives Model of Care®.
2. Preceptor Demonstration of	
3. Student Practice of	
4. Student Demonstration of	

V. Student researches and presents to the preceptor relevant latest developments in academic and clinical midwifery.
VI. Student/Preceptor discussion.
Learning Materials / Resources:
(Please use textbooks less than 5 years old, or most recent edition)

1. Hawley, Louise B. High-Yield Microbiology and Infectious Diseases, Second Edition. Lippincott Williams & Wilkins. 2006.
2. Weaver, Pam and Evans, Sharon K. Practical Skills Guide for Midwifery, 4th Edition. Morningstar Publishing Co. Wasilla. 2007.
3. MEAC Abbreviated NARM Skills Form.
4. MANA Core Competencies for Midwives
5. Midwives Model of Care®.
6. Internet links as needed for latest developments in midwifery care:

The Cochrane Collaboration
EBSCO
National Library of Medicine
PubMed
Medline
SCIRUS
Medscape
World Health Organization

Evaluation Tools / Methods:

1. Answers to study questions: Student must achieve at least 80% correct to pass. The preceptor evaluates each answer for correctness and explains the questions that were incorrect. This counts for 85% of the final grade.
2. Clinical Skills: Student must demonstrate thorough knowledge of each skill. This counts for 5% of the final grade. *Academic courses CAN be completed without the student achieving "mastery" of each skill*, however the skills on the MEAC Abbreviated NARM Skills Form (which is a separate requirement) are not filled in until the student achieves Mastery* of the skill.
3. MANA Core Competencies: Student's ability to apply MANA Core Competencies for Midwives in discussion to simulated and real-life situations. This counts for 5% of the final grade.

Evaluation of NARM Skills and MANA Core Competencies: The student demonstrates thorough knowledge to the satisfaction of the preceptor in the following areas:

The student will be able to, in accordance with safe, evidence-based midwifery care, explain the condition, verbalize etiology and sequelae, verbalize appropriate management for the individual patient, follow up appropriately, consult and refer appropriately, access resources and information, accomplish complete, thorough and timely record keeping, appropriately manage every task involved correctly, professionally, and compassionately, while being receptive and responsive to patient's concerns. She/he will be able to explain her decisions and actions as they relate to possible outcomes and their wider impact.

4. Student presentation of new information in area of study. The preceptor evaluates the correctness of the information presented. This counts for 5% of the grade.

Study Questions

177. Medically relevant microorganisms are included within two broad categories: Name them.

178. Name the group to which the bacteria and viruses belong.

179. Name the group to which fungi and protozoa belong.

180. Name which groups replicate by binary fission and which replicate by multiple fission.

181. Name which groups replicate asexually and which replicate sexually.

182. Explain why viruses are not considered to be living cells.

183. Name the four functions all bacteria must be able to carry out.

184. Describe the mode of action of penicillin that makes it so selective against bacteria.

185. Describe the properties of the cells that are Gram-positive. Gram-negative.

186. Define what is meant by the "generation time" or "doubling" in the growth of bacteria.

187. Explain how the physical environment and nutritional factors influence the growth of microorganisms.

188. In a closed system there are four well-defined phases of bacterial growth: the lag phase, the log phase, the stationary phase, and the death phase. Describe each.

189. Explain why mesophiles are most likely to cause disease in humans.
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190. Name the bacterial genus which is most famous for its ability to degrade a wide variety of compounds.

a. Escherichia
b. Salmonella
c. Thiobacillus
d. Pseudomonas
e. Neisseria

191. Explain when during the growth curve bacteria are most susceptible to penicillin: lag, log, stationary, death, or equally susceptible in all stages.

192. Describe the general features of the glycolytic pathway, especially the steps concerned with energy metabolism.

193. Describe the features of cell growth under aerobic and anaerobic conditions.

194. Explain how DNA reproduces itself.

195. Describe the steps in the synthesis of a protein molecule.

196. Explain how some antibiotics interfere with protein synthesis.

197. Describe a way by which changes can occur in the DNA of bacteria.

198. Explain the distinction between sterilization and disinfection.

199. Describe the difference between a disinfectant and an antiseptic.

200. Explain how much time it will take to achieve sterility of an object.

201. Explain why heat is so effective as an antimicrobial agent.

202. Describe how some bacteria such as those responsible for certain strains of food poisoning resist boiling for hours.

203. Describe how modern autoclaves overcome the resistance of the most heat-resistant microorganisms.

204. Explain the action of alcohol against microorganisms. Describe its effectiveness against spores, viruses such as hepatitis, etc.

205. Explain the action of chlorine on microorganisms.

206. Explain the action of iodine against microorganisms.

207. Describe the concern about using hexachlorophene for antisepsis.

208. Explain some of the mechanisms by which antimicrobial medicines work.

209. Name some of the sources of antimicrobial medicines.

210. Explain how bacteria are tested for susceptibility to different antimicrobial medicines.

211. Explain why antibiotics have a limited usefulness.

212. Explain why it has been difficult to find safe anti-viral medicines.

213. Name two organisms normally found in each of the following locations: nose, throat, vagina, and colon.

214. Explain the difference between normal host defenses and specific acquired immunity.

215. Describe the principle events that occur during developing infection.

216. Explain how antigen-antibody interactions are used in the diagnosis of disease.

217. Explain the difference between cell-mediated immunity and antibody-mediated immunity.

218. Describe the major characteristics of all immune responses.

Clinical Skills (NARM Skills)

II. General Healthcare Skills
(21)-II A. Demonstrates Universal Precautions
(22)-II B. Demonstrates the application of OSHA regulations as they relate to midwifery workplace
(23)-II C. Demonstrates the application of aseptic technique
II D. Demonstrates the use of instruments and equipment including:
(36)-II D 13. Nitrazine paper
(45)-II D 22. Urinalysis strips
(47)-II D 24. Vacutainer/blood collection tube
(48)-II D 25. Vaginal culture equipment
VI. Well-Women Care
(142)-VI C. Performs urinalysis

Core Competencies (MANA Core Competencies for Midwives)

II. General Knowledge and Skills
The midwife provides care incorporating certain concepts, skills and knowledge from a variety of health and social sciences including, but not limited to:
2 G. The principles and appropriate application of clean and aseptic technique and universal precautions
III. Care During Pregnancy
The midwife provides health care, support, and information to women throughout pregnancy. She determines the need for consultation or referral as appropriate. The midwife uses a foundation of knowledge and/or skill which includes the following:
3 N. Identification of, implications of, and appropriate treatment for various infections, disease conditions and other problems, which may affect pregnancy.