COURSE NUMBER AND TITLE
NR.110.203 Microbiology with Lab

CREDITS
4 credits

PRE- AND COREQUISITES
None

COURSE DESCRIPTION
Introduces the core concepts and basic principles in microbiology, examining microorganisms and how they interact with humans and the environment. Information regarding classification of microorganisms, characteristics of different cell types and processes critical for cell survival is presented. Topics such as bacterial metabolism, microbial nutrition, genetics, anti-microbial approaches and interaction of pathogenic bacteria with humans are discussed. The course includes a virtual laboratory component designed to complement lecture topics. The course content provides the foundation of general microbiology necessary for students who are interested in applying to health profession programs.

OBJECTIVES
The course objectives are organized in line with the program outcomes. At the end of the course, the student will be able to:

1. Describe and differentiate among the broad classes of microorganisms, including bacteria, protozoa, fungi, helminthes, and viruses.
2. Describe in appropriate terminology the structure, function and characteristics of prokaryotes, eukaryotes and viruses.
3. Explain the metabolic processes necessary for microbe survival, focusing on the different methods of energy acquisition.
4. Describe ways microbes can cause infection and pathology in humans and apply this understanding to infection prevention and control in healthcare settings.
5. Identify strategies employed by antimicrobial drugs and how they specifically target certain pathogens and apply this understanding to antimicrobial treatment, drug resistance and interaction with host.
6. Demonstrate knowledge and skills in common laboratory procedures.

REQUIRED TEXTBOOKS AND OTHER COURSE MATERIALS

110.203 Syllabus
Late Nite Labs: Students must purchase access to Late Nite Labs in order to complete the lab component of this course. More information about purchasing access can be found in the Blackboard classroom.

Access to a reliable computer and internet connection: It is recommended that students using Windows-based computers should have the Windows 7 or newer operating system, and that Mac users have OS 10.6 or later. We also recommend that you use the most updated version of Google Chrome as your web browser for this course. Other operating systems and web browsers may not be fully supported by the Blackboard and Late Nite Labs software. Please see the Blackboard course site and the Late Nite Labs website for detailed system requirements.

### SUMMARY OF LEARNING ASSESSMENTS/ASSIGNMENTS

<table>
<thead>
<tr>
<th>LEARNING ASSESSMENT/ASSIGNMENT</th>
<th>COURSE OBJECTIVES ADDRESSED</th>
<th>WEIGHT TOWARD FINAL COURSE GRADE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module Quizzes, 8 quizzes in total (10pts each)</td>
<td>1, 2, 3, 4, 5, and 6</td>
<td>20%</td>
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<tr>
<td>Lab Assignments, 8 labs in total (15pts each)</td>
<td>1, 2, 3, 4, 5, and 6</td>
<td>20%</td>
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<tr>
<td>Discussion Essay, 2 posts in total (20pts each)</td>
<td>1, 2, 3, and 4</td>
<td>20%</td>
</tr>
<tr>
<td>Midterm Exam</td>
<td>1, 2, 3, 4, 5, and 6</td>
<td>20%</td>
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<tr>
<td>Final Exam</td>
<td>1, 2, 3, 4, 5, and 6</td>
<td>20%</td>
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### LEARNING ASSESSMENTS/ASSIGNMENTS

**Quizzes**

These are timed quizzes that are designed to test your mastery of the material covered in each module and keep you on track in your reading. The quizzes are open book and open notes. One attempt is allowed for each quiz.

**Labs**

Laboratory sessions are held at the Late Nite Labs (LNL) website at [http://latenitelabs.com/](http://latenitelabs.com/). You are required to complete the lab procedures and a lab assignment for each lab. There are eight labs in total.
Discussion Essays
There are two discussion board essay posts that are due with module 5 and module 10 assignments. They can be accessed from the “Discussion Board” link on the left-side menu of the course site. Essay posts are approximately 500 words in length and will require outside research and analysis of a microbiology topic.

Exams
Comprehensive exams consisting of multiple choice questions will be given to assess student understanding of course content. They are open book, open notes and timed. Only one attempt is allowed for each exam. There are no makeup exams.

ACADEMIC POLICIES
For a full list of academic policies, please see the current academic catalog and handbook.

COURSE POLICIES
All course assignments must be turned in by the specified due date and time. Once the due date and time have passed, 10% of the total points you have earned on the assignment will be deducted per day (per 24 hour period). There are no makeup or extra credit assignments allowed, and assignments submitted more than 7 days late will not receive credit. Please contact the course instructor prior to the due date in the case of extenuating circumstances.

GRADING SCALE

<table>
<thead>
<tr>
<th>RANGE</th>
<th>LETTER GRADE</th>
<th>GRADE POINT</th>
</tr>
</thead>
<tbody>
<tr>
<td>97 – 100</td>
<td>A+</td>
<td>4.0</td>
</tr>
<tr>
<td>93 – 96</td>
<td>A</td>
<td>4.0</td>
</tr>
<tr>
<td>90 – 92</td>
<td>A-</td>
<td>3.7</td>
</tr>
<tr>
<td>87 – 89</td>
<td>B+</td>
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<tr>
<td>83 – 86</td>
<td>B</td>
<td>3.0</td>
</tr>
<tr>
<td>80 – 82</td>
<td>B-</td>
<td>2.7</td>
</tr>
<tr>
<td>77 – 79</td>
<td>C+</td>
<td>2.3</td>
</tr>
<tr>
<td>73 – 76</td>
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</tr>
<tr>
<td>70 – 72</td>
<td>C-</td>
<td>1.7</td>
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<tr>
<td>67 – 69</td>
<td>D+</td>
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<tr>
<td>63 – 66</td>
<td>D</td>
<td>1.0</td>
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<tr>
<td>60 – 62</td>
<td>D-</td>
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<tr>
<td>&lt;60</td>
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<td>0</td>
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HONOR CODE
Students enrolled in the Johns Hopkins University School of Nursing are expected to
conduct themselves in a manner that upholds the values of this institution of higher education. Each student is obligated to refrain from violating academic ethics and maintaining high standards of conduct. In addition, the School of Nursing upholds the professional code of ethics established in the Code of Ethics for Nurses (ANA, 2015). Each student is held accountable for adhering to the American Nurses Association Code of Ethics. For the full Johns Hopkins School of Nursing Honor code, please see the current academic catalog and handbook.

EXAM INTEGRITY & STUDENT IDENTITY VERIFICATION
This course may require the use of technology and/or software to ensure exam integrity and verify the identity of the student taking the exam. Additional information and directions will be provided in the course website.

COMMUNICATION POLICY
Students may communicate with the instructor by email, which is provided in the Contact Information area. The instructor will respond to students within 48 hours. Assignment feedback will be provided to students within two weeks of submission.

All official communication, notices, & announcements will be distributed through student JHU-SON e-mail accounts via blackboard. The student is accountable for checking this account regularly and for all course communication sent to it.

Students are responsible for reading “Netiquette” which is located under Syllabus & Course Info on the Blackboard site. Netiquette provides simple guidelines for civil on-line discourse & behavior, that participants are to follow and expect of one another.

DISABILITY SERVICES
If you have a disability and may require accommodation in this course, please contact the Office of Student Affairs at (410) 955-7545 or SON-DSS@jhu.edu to discuss your specific needs.
### COURSE SCHEDULE

<table>
<thead>
<tr>
<th>Module</th>
<th>Module Subtopics</th>
<th>Learning Activities &amp; Resources</th>
<th>Learning Assignments/Assessments</th>
</tr>
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<tbody>
<tr>
<td>Welcome – Start Here</td>
<td>• Getting Started</td>
<td>Familiarize yourself with Blackboard</td>
<td>Discussion Board: Introduce Yourself, Avoiding Plagiarism Module, Getting Started Lab: Scientific Method</td>
</tr>
</tbody>
</table>
| Module 1: Introduction to Microbes & the Tools to Study Them | • Organism taxonomy  
• Macromolecules  
  • Chapter 1: The Main Themes of Microbiology  
  • Chapter 3: Tools of the Laboratory  
  Review the lecture materials posted in the module for this week. | Module 1 Quiz  
Module 1 Lab: Basic Microscopy & Short Answer Assignment |
| Module 2: Bacteria & Archaea                | • Bacterial Structure and arrangements  
  • Chapter 4: Bacteria and Archaea  
  Review the lecture materials posted in the module for this week. | Module 2 Quiz  
Module 2 Lab: Cultivation of Microorganisms & Short Answer Assignment |
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</table>
| **Module 3: Eukaryotic Cells and Microorganisms** | • Eukaryotic cell classification  
• Eukaryotic structures and cellular arrangement  
• Chapter 5: Eukaryotic Cells and Microorganisms | Module 3 Quiz  
Module 3 Lab: Staining & Short Answer Assignment |
| **Module 4: An Introduction to the Viruses** | • Classification of viruses  
• Capsids and envelopes  
• Chapter 6: An Introduction to the Viruses | Module 4 Quiz  
Module 4 Lab: Expanded Extreme Bacteria & Short Answer Assignment |
| **Module 5: Microbial Nutrition, Ecology and Growth** | • Nutrient sources  
• Environmental factors that influence microbes  
• Chapter 7: Microbial Nutrition, Ecology and Growth | Module 5 Discussion Board Essay |
<p>| <strong>Exam 1</strong> | None | Review content in Module 1 through Module 5 | |</p>
<table>
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</table>
| Module 6: Microbial Metabolism | • Metabolism, anabolism, and catabolism  
• Redox reaction  
  • Chapter 8: Microbial Metabolism | Module 6 Quiz  
Module 6 Lab: Biochemical Characterization & Short Answer Assignment |
| Module 7: Microbial Genetics | • Transcription, translation and the genetic code  
• Genotype and phenotype  
• Horizontal gene transfer  
  • Chapter 9: Microbial Genetics | Module 7 Quiz  
Module 7 Lab: Cellular Respiration & Short Answer Assignment |
| Module 8: Antimicrobial Agents | • Chemical control agents  
• Antimicrobial drugs  
  • Chapter 11: Physical and Chemical Control of Microbes  
  • Chapter 12: Antimicrobial Treatment | Module 8 Quiz  
Module 8 Lab: Control of Bacterial Growth & Short Answer Assignment |
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</table>
| Module 9: Microbe-Human Interactions | • Colonization, infection and disease  
• Opportunistic pathogens  
  • Chapter 13: Microbe-Human Interactions | Module 9 Quiz  
Module 9 Lab: Antibiotic Sensitivity & Short Answer Assignment |
| Module 10: Non-Specific Host Immunity | • Innate immune defenses  
• Anatomical barriers  
• Chemical defenses  
  • Chapter 14: Host Defenses | Module 10 Discussion Board Essay |
| Exam 2               | None                                                                            | Review content in Module 1 through Module 10                                                        |                                                                                                    |