BIOD604: EMERGING INFECTIOUS DISEASES I: BACTERIA AND TOXINS

FALL 2016

BIOD 604
FALL 2017

TUESDAYS 7:20-10:00 P.M.
INNOVATION HALL 207

INSTRUCTOR
Katalin Kiss, Ph.D., PMP®

CONTACT INFORMATION
kkiss@gmu.edu
Office hours: By appointment

COMMUNICATION PLAN
Communication concerning class must be conducted via a gmu.edu e-mail account. I monitor my account during the week between 4 and 10 pm. Allow me 24 hours to respond to your email. Class announcements will all be posted on the course Blackboard site or sent out via email. Blackboard is accessible at http://mymasonportal.gmu.edu. Emails generated by the site go to your GMU email so be sure to keep track of them. Please use “BIOD604” in the subject line of any emails.

BASIC COURSE INFORMATION
BIOD 604 Emerging Infectious Diseases I: Bacteria and Toxins, 3 Credits

BLACKBOARD LOGIN INSTRUCTIONS
1. Log on to GMU Blackboard using your GMU log on.
2. Click on “Courses”
3. 201770.81979 BIOD-604-002 (Fall 2017) by clicking on it.

COURSE DETAILS
This is an introductory class that covers the microbiology, pathogenesis, clinical effects, and epidemiology of bacteria and toxins that pose threats to global health or can be utilized as biological weapons. Pathogenic fungi and protists are covered where relevant. Out of scope for this course are Viruses, Chemical, Nuclear and Radiological weapons.

REQUIRED TEXTBOOK
**E-RESERVES:**
Will be discussed in the first class

**Readings:**
You will need to have access to GMU Libraries E-Journals

**Course Objectives**
Students will be introduced to bacteria, fungi, protists and toxins that are potential agents of bioterrorism, warfare and threats to public health.
Students will learn the basics of metabolism, virulence factors, physiology, immunology, genetics, pathology, diagnostics, detection and prevention of disease caused by each agent.

**Course Outcome**
Students will discuss be able to understand and explain the suitability of the agents as potential weapons and public health threats.

**Assignments and Grading**
Final grade will consist of the sum of three exams, an individual presentation, and discussion leadership opportunities and in class participation, as follows:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participation</td>
<td>20%</td>
</tr>
<tr>
<td>Presentation</td>
<td>20%</td>
</tr>
<tr>
<td>Exam #1</td>
<td>20%</td>
</tr>
<tr>
<td>Exam #2</td>
<td>20%</td>
</tr>
<tr>
<td>Exam #3</td>
<td>20%</td>
</tr>
</tbody>
</table>

Reading assignments will be posted on the Course Blackboard site. In addition, supplemental and suggested websites and videos will be posted on the course Blackboard site. Some of these will be optional but recommended for students who have no background in biology or public health. The optional assignments will be noted as such.

Exams will be administered through Blackboard. These will require the Respondus Lockdown Browser. The Syllabus quiz will be counted toward the participation grade.

**Format and Protocol**
There will be a lecture for a portion of each class.
Students should feel free to ask questions.
Students are expected to have read the assigned readings and journal articles and should be prepared to contribute to the discussion of the day’s readings.
An on-line discussion will be posted each week in addition to a discussing board about on-going recent outbreaks. Participation in the discussion boards counts towards class discussion grade.
Students will be required to give an individual presentation and lead a discussion about an agent. A template will be provided to follow.

A syllabus quiz will be made available that will require the Lockdown Browser. This will allow you to assess the software before taking an exam.
**Grading Scale**

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participation</td>
<td>20%</td>
</tr>
<tr>
<td>Presentation</td>
<td>20%</td>
</tr>
<tr>
<td>Exam #1</td>
<td>20%</td>
</tr>
<tr>
<td>Exam #2</td>
<td>20%</td>
</tr>
<tr>
<td>Exam #3</td>
<td>20%</td>
</tr>
</tbody>
</table>

**Course Policies for Late Work and Make-up Exams**

Please pay attention to the Open and Close dates and times on all of the exams. Please let me know as soon as possible if you have travel plans and will not have access to the course site on any of the due dates.

**Technology Requirements**

Access to GMU Blackboard and internet. Students should be able to download the Respondus Browser.

https://coursessupport.gmu.edu/Students/index.cfm?audencename=Students&categoryname=Bb%20Assessments&datname=Respondus%20LockDown%20Browser

**Student Responsibilities**

Questions can be emailed to me directly or posted to the general class discussion board. Please use the Subject: BIOD604 in all email communications regarding the class. This includes communications with the instructor and your peers. Some of the discussions may bring up issues about dual use and it is important that the discussions are identified as being part of a class.

**George Mason University Diversity Statement**

Mason seeks to create and sustain inclusive learning environments where all are welcomed, valued, and supported.

**Mason Policy on Religious Holidays**

“It is the obligation of students to provide faculty, within the first two weeks of the semester, with the dates of major religious holidays on which they will be absent due to religious observances.” Please let me know if any holidays will impact your ability to meet the due dates or participate in the group activity. The Religious holiday calendar can be found here:

http://ulife.gmu.edu/calendar/religious-holiday-calendar/

**Academic Integrity**

Student members of the George Mason University community pledge not to cheat, plagiarize, steal, or lie in matters related to academic work.

http://oai.gmu.edu/the-mason-honor-code-2/

**Disability Accommodations**

Disabilities: If you are a student with a disability and you need academic accommodations, please let me know and contact the Office of Disability Services at 703-993-2474 http://ods.gmu.edu/students/.
All academic accommodations must be arranged through that office with appropriate documentation.
http://ods.gmu.edu/students/documentation.php

CLASSROOM DECORUM AND NETIQUETTE
In this course we will often engage in discussions on topics with no definitive answer and as such differences of opinion will be the norm. I encourage debate but I will also expect respect for opposing viewpoints. To this end I will tolerate neither personal attacks nor inappropriate language. Please see the link below for hints on proper netiquette
http://www.albion.com/netiquette/corerules.html

COURSE RESOURCES
Resources are embedded in the unit of the Course Content Section of the Course on Blackboard.

STUDENT PRIVACY
Information concerning student privacy at GMU can be found here:
http://registrar.gmu.edu/ferpa/

STUDENT SERVICES
Distant education services, University Libraries;
http://library.gmu.edu/for/online

WRITING CENTER
http://writingcenter.gmu.edu/

COUNSELING AND PSYCHOLOGICAL SERVICES
http://caps.gmu.edu/
**COURSE SCHEDULE**

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>TOPIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>29AUG</td>
<td>TECHNOLOGY PREPARATION, SYLLABUS QUIZ&lt;br&gt;READ COURSE SYLLABUS, ORIENTATION&lt;br&gt;SITE ON COURSE CONTENT&lt;br&gt;UNIT - INTRODUCTION TO MICROBIOLOGY</td>
</tr>
<tr>
<td>2</td>
<td>5AUG</td>
<td>UNIT - BASIC BIOLOGY, TAXONOMY, NUCLEIC ACIDS, STRUCTURE OF MICROBES</td>
</tr>
<tr>
<td>3</td>
<td>12AUG</td>
<td>UNIT - BASIC BIOLOGY, MICROBIOMES, IMMUNOLOGY</td>
</tr>
<tr>
<td>4</td>
<td>19AUG</td>
<td>UNIT - BASIC BIOLOGY, PATHOGENESIS AND ANTIBIOTICS</td>
</tr>
<tr>
<td>5</td>
<td>26AUG</td>
<td>UNIT - GENETIC ENGINEERING AND THE RISE OF ANTIBIOTIC RESISTANCE</td>
</tr>
<tr>
<td>6</td>
<td>3OCT</td>
<td>UNIT - BASIC BIOLOGY EPIDEMIOLOGY, VACCINES, DIAGNOSTICS AND DETECTION</td>
</tr>
<tr>
<td>7</td>
<td>10OCT</td>
<td>EXAM 1 OPENS</td>
</tr>
<tr>
<td>8</td>
<td>17OCT</td>
<td>UNIT - TOXINS</td>
</tr>
<tr>
<td>9</td>
<td>24OCT</td>
<td>UNIT - AGRICULTURAL THREATS</td>
</tr>
<tr>
<td>10</td>
<td>31OCT</td>
<td>UNIT - OPPORTUNISTIC PATHOGENS</td>
</tr>
<tr>
<td>11</td>
<td>7NOV</td>
<td>UNIT - VECTORS</td>
</tr>
<tr>
<td>12</td>
<td>14NOV</td>
<td>UNIT - VECTOR BORNE PATHOGENS</td>
</tr>
<tr>
<td>13</td>
<td>21NOV</td>
<td>EXAM 2 OPENS</td>
</tr>
<tr>
<td>14</td>
<td>28NOV</td>
<td>UNIT - SEXUALLY TRANSMITTED AND DROPLET TRANSMITTED PATHOGENS</td>
</tr>
<tr>
<td>15</td>
<td>5DEC</td>
<td>UNIT - FOOD AND WATERBORNE PATHOGENS</td>
</tr>
<tr>
<td>16</td>
<td>12DEC</td>
<td>UNIT - CONVENTIAL BACTERIAL WEAPONS</td>
</tr>
<tr>
<td>17</td>
<td>12DEC</td>
<td>EXAM 3 OPENS</td>
</tr>
</tbody>
</table>
PRESENTATION

Each student will select one agent from the suggested list of agents. Each group will explore the science behind the use of the chosen agent as a potential weapon and public health threat. Students will be able to select from the list of agents the first day of class. Due dates will be available at that time.

**THE PRESENTATION-SYNTAX (20%)**

- The presentation will be delivered as a PowerPoint Presentation, using a light background with dark text.
- You must use one of the following fonts: Calibri, Cambia, Arial, Trebuchet
- All slides will have a title of at least 18 point
- Text should be no smaller than 14 point

**THE PRESENTATION-CONTENT (80%)**

- A Title slide
- Strategies – weapon of mass destruction, disruption, global health threat:
  - Intended targets, number of targets, geographic locations, weather, security, time to detection, etc.
- How could you acquire the agent?
- How could the agent be made, delivered?
- Explain any strategies to avoid countermeasures.
- Growth protocols
- Morphological description of the agents,
- Virulence factors/pathogenicity factors/plasmids
- Natural reservoirs
- Commercial availability of the agent
- Persistence in the environment
- Mode of natural transmission
- Infectious/lethal dose/mortality/morbidity rates
- How long before symptoms appear
- Symptoms,
- Diagnostics
- Detection
- Available countermeasures
- Treatment/antibiotic regimen,
- Known antibiotic resistance,
- Vaccine status (is there a vaccine? Does it work? Why isn’t there a vaccine?),
- History of epidemics of the disease
- Recent outbreaks
- Year to date occurrence in US and then worldwide (if available)
- Impact of these outbreaks
- Recommended decontamination (or remediation- for the plant pathogens)
- Evidence that any of the agents have been used as a weapon historically?
- Evidence that any of the agents have been developed as a weapon historically?
- What are the factors of the agents that make them candidates as weapons?
- How could it be spread?
- What are the factors that discount the use of the agent as weapon?
- References use