BIOD604: EMERGING INFECTIOUS DISEASES I: BACTERIA AND TOXINS
FALL 2018

INSTRUCTOR
Katalin Kiss, Ph.D., PMP®

CONTACT INFORMATION
kkiss@gmu.edu is the preferred method of contact.
Office hours: Preferably by appointment. We will use Blackboard Collaborate to communicate.

COMMUNICATION PLAN
Communication concerning class must be conducted via a gmu.edu e-mail account. Allow me 24 hours to respond to your email, Monday-Thursday and 48 hours Friday-Sunday.
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, Asynchronous, on-line course (100%)

BLACKBOARD LOGIN INSTRUCTIONS
1. Log on to GMU Blackboard using your GMU log on.
2. Click on “Courses”
3. Select 201870.81815 BIOD-604-DL1 (Fall 2018) by clicking on it.

COURSE DETAILS
No Prerequisites.
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- AVAILABLE ON-LINE THROUGH GMU LIBRARY:
MEDICAL MICROBIOLOGY
Patrick R. Murray, Ken S. Rosenthal, Michael Pfaller
Elsevier
There is also a free e-book that comes with the text book. Copy and paste this into your browser: https://studentconsult.inkling.com/redeem/ and enter the code from the inside cover of your test book

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

**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.

Some of the agents covered in the lectures in this course are: *Pseudomonas; Acinetobacter; Klebsiella; Clostridium; Cryptococcus; Aspergillus; Pneumocystis; Listeria; E. coli; Salmonella; Shigella; Clostridium; Vibrio; Bacillus, Campylobacter; Entamoeba; Giardia; Cryptosporidium; Nematodes; Malaria; Leishmaniasis; Babesia; Rickettsia; Coxiella; Ehrlichia; Borrelia; Treponema; Neisseria; Haemophilus; Chlamydia; Mycoplasma; Trichomonas; Staphylococcus; Streptococcus; Mycobacterium; Neisseria, Haemophilus; Blastomyces; Coccidioides; Histoplasma; Phoma, Ralstonia Raymondibacter, Sclerophthora, Synchytrium, Xanthomonas; conventional threat agents.

**Course Outcome**
Students will be able to explain the functions of the immune system and transmission, treatment, prevention and virulence factors of the agents. Students will be able to analyze agents for their potential as weapons and categorize agents according to their threat potential.

**Assignments and Grading**

Weekly Assignments:
Assessments and Discussions: Assessments will be short quizzes available through Blackboard. They will be open note and open text. Weekly Discussion/Participation: Topics will be posted at the beginning of every unit and every week. You will be required to post as well as respond to another post.

Exams will be administered through the Respondus Lockdown Browser. Please see the technology requirements section or the GMU Blackboard landing page for instructions on how to download.

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. The quiz will be considered as a 'Weekly Assessment' and the grade part of the total Weekly Assessment grade.

There will be a project. Each student will present their own offensive scenario. You will be assigned an agent at the beginning of class. Each student will then present a defensive scenario to another student’s offensive scenario. You will be provided with your defensive agent at the beginning of class as well.

**Grading Scale**
The entire course is worth 1000 points. Your total points will be a sum of all the points earned. Your grade will be the percentage of points earned out of a possible 1000 points. The numerical grade is converted into a letter grade at the end of the semester. I defer to the default program in the Blackboard Learning Management System to convert your percentage into a letter grade. Blackboard does NOT round up. An 89.99 will be converted to a B+.
DISTRIBUTION OF POINTS:

Weekly Assessments: 255 points
Weekly Discussion: 255 points
Offensive project: 100 points
Defensive project: 90 points
Exam 1: 100 points
Exam 2: 100 points
Exam 3: 100 points

Breakdown: 15 weekly assessments, worth 15 points each. 15 weekly discussions worth 10 points for posting and 5 points for your response. Please pay attention to the due dates. In general, due dates for discussions and assessments are staggered so they are not due on the same day as an exam.

COURSE POLICIES FOR LATE WORK AND MAKE-UP EXAMS

In most cases due dates are on a Monday. This is to allow you the weekend to complete any assignments. Please pay attention to the Open and Close dates and times on all of the weekly assessments and 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.
Firefox, Safari and Chrome should be acceptable Browsers.
Students should be able to download the Respondus Browser.

STUDENT RESPONSIBILITIES

Students are expected to complete the assigned reading and watch the lectures. Students are expected to complete these activities within the week they are assigned. 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 (if the link does not open, copy and paste into your browser):
https://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. The Mason honor code can be found here (if the link does not open, copy and paste into your browser):
https://oai.gmu.edu/mason-honor-code/

**DISABILITY ACCOMMODATIONS**
Disabilities: If you are a student with a disability and you need academic accommodations, please see me and contact the Office of Disability Services at 703-993-2474 https://ds.gmu.edu/. All academic accommodations must be arranged through that office with appropriate documentation.

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

Counseling and Psychological Services http://caps.gmu.edu/
COURSE SCHEDULE
Expect to work 6-9 hours per week on assignments for this course.

Lectures, videos and reading assignments are listed in the unit modules for each week on the course Blackboard site.

<table>
<thead>
<tr>
<th>Dates</th>
<th>Weeks</th>
<th>Units</th>
<th>Graded Assignments</th>
<th>Due Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>27AUG2018-3SEP2018</td>
<td>Week 1</td>
<td>Orientation</td>
<td>Assignments: Syllabus Quiz-Assessment #1</td>
<td>Due Date: 1OCT2018</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Discussion Board Post #1</td>
<td></td>
</tr>
<tr>
<td>1SEP2018-10SEP2018</td>
<td>Week 2</td>
<td>Unit 1: Introduction to Microbiology, Disease and Biological Weapons</td>
<td>Assignments: Discussion Board Post #2</td>
<td>Due Date: 10SEP2018</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Weekly Assessment #2</td>
<td></td>
</tr>
<tr>
<td>8SEP2018-17SEP2018</td>
<td>Week 3</td>
<td>Unit 2: Basic biology: Intro to taxonomy and basic biology</td>
<td>Assignments: Discussion Board Post #3</td>
<td>Due Date: 17SEP2018</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Weekly Assessment #3</td>
<td></td>
</tr>
<tr>
<td>15SEP2018-24SEP2018</td>
<td>Week 4</td>
<td>Unit 3: Virulence Factors &amp; Toxins- Virulence</td>
<td>Assignments: Discussion Board Post #4</td>
<td>Due Date: 24SEP2018</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Weekly Assessment #4</td>
<td></td>
</tr>
<tr>
<td>22SEP2018-01OCT2018</td>
<td>Week 5</td>
<td>Unit 3: Virulence Factors &amp;Toxins-Toxins</td>
<td>Assignments: Discussion Board Post #5</td>
<td>Due Date: 01OCT2018</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Weekly Assessment #5</td>
<td></td>
</tr>
<tr>
<td>29SEP2018-08OCT2018</td>
<td>Week 6</td>
<td>EXAM, UNITS 1, 2 &amp; 3</td>
<td>Assignments: Exams, Units 1, 2, 3</td>
<td>Due Date for Exam: 08OCT2018</td>
</tr>
<tr>
<td></td>
<td></td>
<td>External Defenses, Diagnostics and Intro. to Antibiotics</td>
<td>Discussion Board Post #6, Unit 4, week 6</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Weekly Assessment #6, Unit 4, week 6</td>
<td>Due Date for Discussion Board and weekly assessment: 15OCT2018</td>
</tr>
<tr>
<td>06OCT2018-15OCT2018</td>
<td>Week 7</td>
<td>Unit 4: External Defenses: Antibiotic Resistance and Epidemiology</td>
<td>Assignments: Discussion Board Post #7</td>
<td>Due Date: 15OCT2018</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Weekly Assessment #7</td>
<td></td>
</tr>
<tr>
<td>13OCT2018-22OCT2018</td>
<td>Week 8</td>
<td>OFFENSIVE PRESENTATION DUE</td>
<td>Assignments: Offensive Presentations due</td>
<td>Due Date: 22OCT2018</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Unit 5: Internal Defenses, Immunology, Part 1</td>
<td>Discussion Board Post #8</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Weekly Assessment #8</td>
<td></td>
</tr>
<tr>
<td>20OCT2018-29OCT2018</td>
<td>Week 9</td>
<td>Unit 5: Internal Defenses: Microbiomes and Immunology, Part 2</td>
<td>Assignments: Discussion Board Post #9 Weekly Assessment #9</td>
<td>Due Date: 29OCT2018</td>
</tr>
<tr>
<td>---------------------</td>
<td>--------</td>
<td>---------------------------------------------------------------</td>
<td>---------------------------------------------------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>27OCT2018-5NOV2018</td>
<td>Week 10</td>
<td>EXAM, UNITS 4 &amp; 5 Unit 6: Food and Waterborne Pathogens</td>
<td>Assignments: Exam 2, Units 4, 5 and 6 Discussion Board Post #10 Weekly Assessment #10</td>
<td>Due Date for Exam: 5NOV2018 Due Date for Discussion Board and Weekly Assessment: 12NOV2018</td>
</tr>
<tr>
<td>3NOV2018-12NOV2018</td>
<td>Week 11</td>
<td>Unit 7: Vector-borne Pathogens- the Vectors</td>
<td>Assignments: Discussion Board Post #11 Weekly Assessment #11</td>
<td>Due Date: 12NOV2018</td>
</tr>
<tr>
<td>10NOV2018-19NOV2018</td>
<td>Week 12</td>
<td>Unit 7: Vector-borne Pathogens- the Pathogens</td>
<td>Assignments: Discussion Board Post #12 Weekly Assessment #12</td>
<td>Due Date: 19NOV2018</td>
</tr>
<tr>
<td>17NOV2018-26NOV2018</td>
<td>Week 13</td>
<td>Unit 7: Vector-borne pathogens- Malaria Unit 8: Opportunistic Pathogens</td>
<td>Assignments: Discussion Board Post, Unit 7 #13 Weekly Assessment, Unit 7 #13 Discussion Board Post, Unit 8 #14 Weekly Assessment, Unit 8 #14</td>
<td>Due Date for all: 26NOV2018</td>
</tr>
<tr>
<td>24NOV2018-03DEC2018</td>
<td>Week 14</td>
<td>DEFENSIVE PRESENTATION DUE Unit 9: Agricultural Pathogens Unit 10: Sexually Transmitted Pathogens and Droplet -borne pathogens</td>
<td>Assignments: Defensive Presentation Due Discussion Board Post, Unit 9 #15 Weekly Assessment, Unit 9 #15 Discussion Board Post, Unit 10 #16 Weekly Assessment, Unit 10 #16</td>
<td>Due Date for all: 03DEC2018</td>
</tr>
<tr>
<td>01DEC2018-10DEC2018</td>
<td>Week 15</td>
<td>Unit 11: Conventional Biological Weapons</td>
<td>Assignments: Discussion Board Post #17 Weekly Assessment #17</td>
<td>Due Date: 10DEC2018</td>
</tr>
<tr>
<td>08DEC2018-17DEC2018</td>
<td>Week 16</td>
<td>EXAM, Units, 6, 7, 8, 9, 10 &amp; 11</td>
<td>Assignments: EXAM 3, Unit 6-11</td>
<td>Due Date: 17DEC2018</td>
</tr>
</tbody>
</table>
RUBRIC FOR THE OFFENSIVE PROJECT

You will be assigned an agent for your offensive project the first week of class. Your presentation will be a scenario of how you could use your agent as a weapon.

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
- Presentation will be delivered as a PowerPoint presentation with an optional voice recording. You may choose one person to do the entire thing or divide it up— that is your choice
- For the voice recording, you are welcome to use shareware, but Kaltura is available through GMU’s Blackboard.
- Information on how to get Kaltura is in the Orientation module. The module can be found under the left hand menu of the Blackboard site.
- (Note— for those of you are running Windows 10 OS, there are compatibility issues with Kaltura. Helpful hints are on the Orientation site)

THE PRESENTATION-CONTENT (80%)

- A Title slide
- A disclaimer stating the presentation is part of a class project for Biodefense 604. It will have your name on it, my name on it and the GMU logo.
- Basic biology of the agent, including virulence factors, natural reservoirs, morphological descriptions, and taxonomy.
- Natural mode of transmission and summary of naturally occurring infections or outbreaks.
- Infectious/lethal dose/mortality/morbidity rates
- Symptoms
- Diagnostics
- Detection
- Intended target
- Intended outcome
- Method of delivery
- Available countermeasures
- Treatment/antibiotic regimen
- Known antibiotic resistance
- Analysis of biology of the agent and suitability to the method of delivery, intended target and intended outcome.
- Strategies should consider: geographic locations, weather, security, time to detection, etc.
- How would you acquire the agent?
- Commercial availability of the agent
- How the agent was grown for delivery?
- How much of the agent is needed for your scenario?
- Explain any strategies to avoid countermeasures.
- References used
- Evidence that the agent has been used as a weapon historically?
- Evidence that the agent has been developed as a weapon historically?
- What are the factors that discount the use of the agent as weapon?
Rubric for the Defensive Project
You will be assigned an agent for your defensive project by the second week of class. Your presentation will be a scenario of the response to release in the offensive scenario.

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 points
- Text should be no smaller than 14 points
- Presentation will be delivered as a PowerPoint presentation with an optional voice recording. You may choose one person to do the entire thing or divide it up- that is your choice
- For the voice recording, you are welcome to use shareware, but Kaltura is available through GMU’s Blackboard.
- Information on how to get Kaltura is in the Orientation module. The module can be found under the left-hand menu of the Blackboard site.
- (Note-for those of you are running Windows 10 OS, there are compatibility issues with Kaltura. Helpful hints are on the Orientation site)

The Presentation-Content (80%)
- A Title slide
- A disclaimer stating the presentation is part of a class project for Biodefense 604. It will have your name on it, my name on it and the GMU logo.
- Natural mode of transmission and summary of naturally occurring infections or outbreaks.
- Infectious/lethal dose/mortality/morbidity rates in naturally occurring outbreaks.
- How would the release first be detected? Address several possibilities.
- What agency is the first to respond? What do they do?
- For the region the release occurred- what was the most likely method of diagnostic in the patient?
- What methods of treatment are needed?
- What methods of quarantine would be needed?
- What methods of surveillance are to be used? For how long?
- What is the most like likely methods of detection in the environment?
- What countermeasures would be available on hand?
- What is the cost of the treatments? Who pays for it?
- Vaccine status (is there a vaccine? Does it work? Why isn’t there a vaccine?),
- Strategies should consider: geographic locations, weather, security, time to detection, etc. How many cases are expected?
- How would you use the agent to track down the responsible party? Is that even possible?
- References used
- Persistence in the environment- is it possible for infrastructure to be decontaminated? How much does this cost? Who pays for it?
- History of epidemics of the disease.
- References used