BIOD604: EMERGING INFECTIOUS DISEASES I: BACTERIA AND TOXINS

BIOD 604

FALL 2020

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 Mondays- Thursdays in the evening. Allow me 24 hours to respond to your email. For Fridays-Sunday, allow me 48 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. **202070.81413-BIOD-604-DL1** (Fall 2020) 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

Microbiology, OpenStax, Rice University, 2018. Nina Parker (Author), Mark Schneegurt (Author), Anh-Hue Thi Tu (Author), Brian M. Forster (Author), Philip Lister (Author).

E-RESERVES:

No reserves, but you should be able to access this text book on line through the GMU library:
From Medical Microbiology, 8th ed. Murray, et al. 2016 Elsevier.

READINGS:

Please see Appendix A.

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 microbial metabolism, mechanisms of actions of microbial virulence factors, physiology, immunology, genetics, pathology, diagnostics, detection and prevention of disease caused by each agent.

LEARNING OUTCOMES

Students will demonstrate basic knowledge about the physiology of cells and microbes, understand the mechanism of virulence for pathogens, describe mechanisms of interaction pathogens have with the immune system and analyze pathogens for their potential to become public health threats or to be used by bioterrorists. Students will have to hypothesize scenarios of intentional release of an agent and evaluate peer reviewed literature related to the agents.

ASSIGNMENTS AND GRADING

Unit	Topic	Activities	Points
1	History and Introduction	Unit 1 Assessment	10
		Unit 1 Discussion	20
2	Basic Biology	Unit 2 Assessment	10
		Unit 2 Discussion	20
3	Antibiotics	Unit 3 Assessment	10
		Unit 3 Discussion	20
4	Toxins	Unit 4 Assessment	10
		Unit 4 Discussion	20
		Exam 1	100
5	Virulence	Unit 5 Assessment	15
		Unit 5 Discussion	20
6	Epidemiology	Unit 6 Assessment	15
		Unit 6 Discussion	20
7	Innate Immunology	Unit 7 Assessment	15
		Unit 7 Discussion	20
8	Adaptive Immunology	Unit 8 Assessment	15
		Unit 8 Discussion	20
		Exam 2	100
9	Skin and Eye	Unit 9 Assessment	15
		Unit 9 Discussion	25

		Unit 10 Assessment	15
10	Respiratory	Unit 10 Discussion	25
		Unit 11/12 Assessment	20
11	Digestive	Unit 11 Discussion	25
12	Nervous	Unit 12 Discussion	25
		Exam 3	100
		Unit 13 Assessment	20
13	Urogenital	Unit 13 Discussion	30
		Unit 14 Assessment	20
14	Vectors	Unit 14 Discussion	30
		Unit 15 Assessment	20
15	Circulatory	Unit 15 Discussion	30
		Unit 16 Assessment	15
16	Agriculture	Unit 16 Discussion	25
		Exam 4	100

The total value of the course is 1000 points. All graded assignments are weighted equally.
There is no comprehensive final exam. Each exam incorporates knowledge learned in previous units.
All assessments, discussions and exams are administered through Blackboard.
Assessments and discussions are open book and open note.
Exams are closed book, closed notes and no other resources allowed.

Exams will be administered through Blackboard. These will require the Respondus Lockdown Browser. Their will be a practice syllabus assessment and it will also require the LockDown Browser. This will allow you to assess the software before taking an exam.

Format and Protocol

There will be a lecture for a portion of each class. Copies of slides will be provided.
There will be assigned readings from your text.
Students should feel free to post questions to the discussion board for questions about class.

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, assignments and discussion boards.
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, internet browser such as Chrome, Firefox, Edge.
Students should be able to download the Respondus Browser. It is available on the Blackboard site. This does not work well OS that are not MAC or Windows. Please contact me ASAP if you run another OS and cannot download the Respondus Browser.

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.
https://oai.gmu.edu/wp-content/uploads/2018/08/George-Mason-University-Honor-Code-2018-2020-final.pdf

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 https://ds.gmu.edu/
All academic accommodations must be arranged through that office.

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/

READING ASSIGNMENTS

Start Week	Unit	Agent	Topic	Reading Assignments
24-Aug	1	No specific agent	History and Introduction	From your text: Chapter 1; Chapter 2 (2.4); Chapter 3; Chapter 4 (4.1, 4.2, 4.3, 4.4)
31-Aug	2		Basic Biology	From your text: Chapter 10 (10.1, 10.2, 10.3, 10.4); Chapter 11 (11.1-11.2, 11.3,11.4,11.5,11.7); Chapter 12 (12.1, 12.2)
7-Sep	3		Antibiotics	From your text: Chapter 14 (14.1, 14.2,14.4,14.5)
14-Sep	4	Ricin, Abrin, Tricothecenes, Tetrodotoxin, Saxitoxin, Conotoxin	Toxins	From Medical Microbiology, 8th ed. Murray, et al. 2016 Elsevier. Chapter 67 (Introduction, Trichothecenes)
				Toxins (Basel) 2019 Jun 6;11(6):324. doi: 10.3390/toxins11060324. Ricin: An Ancient Story for a Timeless Plant Toxin
				Cetinkaya F, Mus TE. Shellfish poisoning and toxins. Cdc-pdf[PDF – 5 pages]External J Biol Environ Sci. 2012;6:115-19.
				Mar Drugs. 2015 Oct; 13(10): 6384–6406. doi: 10.3390/md13106384.Tetrodotoxin, an Extremely Potent Marine Neurotoxin: Distribution, Toxicity, Origin and Therapeutical Uses
				https://www.chemistryworld.com/podcasts/conotoxins/6950.article#/ (2014. Conotoxins)
21-Sep	5	No specific agent	Virulence	From your text: Chapter 15 (15.1, 15.2, 15.3, 15.4)
				Biosafety in Microbiological Laboratories, 5th edition. Section II, Section IV, Section VIII https://www.cdc.gov/labs/pdf/CDC-BiosafetyMicrobiologicalBiomedicalLaboratories-2009-P.PDF
28-Sep	6		Epidemiology	From your text: Chapter 16 (16.1, 16.2, 16.3, 16.4)

5-Oct	7		Innate Immunology	From your text: Chapter 17 (17.1, 17.2, 17.3, 17.4, 17.5)
12-Oct	8		Adaptive Immunology	From your text: Chapter 18 (18.1, 18.2,18.3, 81.4, 18.5); Chapter 19 (19.1, 19.2); Chapter 20 (20.1,20.2)
19-Oct	9	*Staphylococcus, Streptococcus,Pseudomonads, B. anthracis, Chlamydia*	Skin and Eye	From your text: Chapter 21 (21.1, 21.2)
26-Oct	10	*Mycobacterium, Haemophilus, Legionella, Mycoplasma, Coxiella, Burkholderia*	Respiratory	From your text: Chapter 22 (22.1, 22.2)
2-Nov	11	*Vibrio, E. coli/Shigella, Salmonella, Campylobacter, Clostridium,*	Digestive	From your text: Chapter 24 (24.1, 24.2, 24.3)
2-Nov	12	*Neisseria, Listeria, Clostridia*	Nervous	From your text: Chapter 26 (26.1, 26.2)
9-Nov	13	*Leptospira, Mycoplasma, Neisseria, Treponema, Haemophilus*	Urogenital	From your text: Chapter 23 (23.1, 23.2)
16-Nov	14	Lice, fleas, ticks, mosquitoes, biting flies	Vectors	From Medical Microbiology, 8th ed. Murray, et al. 2016 Elsevier. (Chapter 78. Mites, ticks, Insecta)
16-Nov	15	*Brucella, Francisella, Yersinia, Ehrlichia, Anaplasma, Bartonella, Borrelia, Rickettsia, Plasmodium, Schistosoma*	Circulatory	From your text: Chapter 25 (25.1, 25.2, 25.4, Malaria)

30-Nov	16	*Sclerophthora, Synchytrium, Xanthomonas, Phytophthera, Fusarium, Phoma, Ralstonia, Rathayibacter*	Agriculture	http://www.promusa.org/Fusarium+wilt. Fusarium wilt of banana
				Virginia Cooperative Extenstion. 2015. Publication 426-413. Potatoes, Peppers and Eggplants
				Virginia Cooperative Extenstion. 2012. Publication ANR-6. Late Blight of Tomato and Potato
				R. G. Kenneth, Koltin & I. Wahl Payak & Renfro ; Oregon State Univeristy Extension Service. Brown Strip Downy Mildew
				National IPM Center/APHIS/. National Pest Alert. Ralstonia solancearum, race 3, biovar 2
				Susan B. Jepson, Oregon State Univeristy Extension Service 2012. Red leaf blotch of soybean
				Melodie Putnam, Oregon State University Plant Clinic, Oregon State Univeristy Extension Service. Potato Wart
				Susan B. Jepson, Oregon State Univeristy Extension Service 2012. Bacterial leaf streak of rice
				Purdue.edu. Rathayibacter toxicus

COURSE SCHEDULE

Start Week	Unit	Topic	Activities	Due dates	Points
24-Aug	1	History and Introduction	Unit 1 Assessment	21SEP2020 11:59 pm	10
			Unit 1 Discussion	31AUG2020, 11:59 pm	20
31-Aug	2	Basic Biology	Unit 2 Assessment	21SEP2020 11:59 pm	10
			Unit 2 Discussion	07SEP2020 11:59 pm	20
7-Sep	3	Antibiotics	Unit 3 Assessment	21SEP2020 11:59 pm	10
			Unit 3 Discussion	14SEP2020, 11:59 pm	20
14-Sep	4	Toxins	Unit 4 Assessment	21SEP2020 11:59 pm	10
			Unit 4 Discussion	21SEP2020 11:59 pm	20
14-Sep	1,2,3 & 4		Exam 1	21SEP2020 11:59 pm	100
21-Sep	5	Virulence	Unit 5 Assessment	19OCT2020 11:59 pm	15
			Unit 5 Discussion	28SEP2020 11:59 pm	20
28-Sep	6	Epidemiology	Unit 6 Assessment	19OCT2020 11:59 pm	15
			Unit 6 Discussion	05OCT2020 11:59 pm	20
5-Oct	7	Innate Immunology	Unit 7 Assessment	19OCT2020 11:59 pm	15
			Unit 7 Discussion	12OCT2020 11;59 pm	20
12-Oct	8	Adaptive Immunology	Unit 8 Assessment	19OCT2020 11:59 pm	15
			Unit 8 Discussion	19OCT2020 11:59 pm	20
12-OCT	5, 6, 7, & 8		Exam 2	19OCT2020 11:59 pm	100
19-Oct	9	Skin and Eye	Unit 9 Assessment	09NOV2020 11:59 pm	15
			Unit 9 Discussion	26OCT2020 11:59 pm	25
26-Oct	10	Respiratory	Unit 10 Assessment	09NOV2020 11:59 pm	15
			Unit 10 Discussion	02NOV2020 11:59 pm	25
2-Nov	11	Digestive	Unit 11/12 Assessment	09NOV2020 11:59 pm	20
			Unit 11 Discussion	09NOV2020 11:59 pm	25

2-Nov	12	Nervous	Unit 12 Discussion	09NOV2020 11:59 pm	25
02-Nov	9, 10, 11 & 12		Exam 3	09NOV2020 11:59 pm	100
9-Nov	13	Urogenital	Unit 13 Assessment	04DEC2020 11:59 pm	20
			Unit 13 Discussion	16NOV2020 11;59 pm	30
16-Nov	14	Vectors	Unit 14 Assessment	04DEC2020 11:59 pm	20
			Unit 14 Discussion	30NOV2020 11:59 pm	30
16-Nov	15	Circulatory	Unit 15 Assessment	04DEC2020 11:59 pm	20
			Unit 15 Discussion	30NOV2020 11:59 pm	30
30-Nov	16	Agriculture	Unit 16 Assessment	04DEC2020 11:59 pm	15
			Unit 16 Discussion	04DEC2020 11:59 pm	25
04-DEC	13,14,15, & 16		Exam 4	10DEC2020 11:59 pm	100