MD ID 6535: COVID-19 Exploration in Real Time Syllabus

Credit Hours: 1

Contact Information

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Course Information

Brief Description of Course

This 1-credit elective course offers medical students the opportunity to participate in a faculty-guided analysis of the COVID-19 pandemic as it is occurring. Students will be able to describe the basic biology and pathophysiology of, as well as the public health and clinical responses to COVID-19, apply basic epidemiologic concepts to the analysis of the COVID-19 pandemic in real time, and analyze the effects of COVID-19 on underserved populations, healthcare ethics and the mental health of both clinicians and the overall population.

Course Objectives

As a result of successfully completing the COVID-19 course, students will be able to:

1. Describe the basic biology and pathophysiology of, as well as the clinical response to COVID-19
2. Apply basic epidemiologic concepts to the analysis of the COVID-19 pandemic in real time
3. Analyze the effects of COVID-19 on underserved populations, healthcare ethics and the mental health of both clinicians and the overall population

Course Format & Schedule

Timeline

This course will run for four weeks with a combination of synchronous and asynchronous learning modalities and discussions. There will be approximately 3 hours of synchronous, Zoom-based didactic and discussion per week; course will meet 2X per week for 1.5 hours per session. A variety of experts from different areas of medicine and public health will lead discussions with the students about different aspects of virus biology and effects on health. Each week will also include readings, videos, assessments and self-directed learning activities.

Class Dates & Topics (Classes meet 5:30-7:30 P.M. on Tuesdays & Thursdays)

1. April 7, 2020 COVID-19: Novel Coronavirus (SARS CoV 2) Overview (Previously recorded webinar)
2. April 9, 2020 Infectious Disease Epidemiology: A Rapid Overview
3. April 14, 2020 Coronaviridae 101
4. April 16, 2020 Human Respiratory Coronaviruses & Human Health
5. April 21, 2020 SARS CoV-2: Pharmacologic Prevention & Treatment
6. April 23, 2020 SARS CoV-2 Containment/Suppression & Mitigation

7. April 28, 2020 Mental Health and Wellness & the COVID-19 Pandemic
8. April 30, 2020 COVID-19 in Underserved Populations
9. May 5, 2020 Ethics & the COVID-19 Pandemic

Educational and Instructional Modalities

Modality	Percentage
Zoom-based lectures and discussion	25%
Readings; videos; online modules	50%
Discussion board participation	10%
Analysis of emerging epidemiologic data	15%

Role of the Student in this Course

Students are expected to be active participants in this course. Given the dynamic nature of the pandemic and the unknown clinical demands on faculty teaching the course, students must be willing to adapt to sudden changes in the course schedule. Lectures and discussions will be recorded as much as possible to help with flexible learning.

Required Textbooks/Readings

All readings and videos will be provided on Canvas.

Assessment & Grading

	Weight	Must Pass/ Must Complete	Due Date
Course Assessments			
Basic knowledge quizzes	60%		Multiple; see Canvas
Narrative Assessments			
Discussion board participation		Must submit a minimum of two posts	See Canvas
Assignments and Must Complete Elements			
COVID-19 epidemiology project	40%		April 30, 2020

Basic Knowledge Quizzes

There will be six (6) multiple choice quizzes based on information in the required readings for each class.

Quizzes will be posted in Canvas randomly during the first 10 minutes of each class.

Discussion Board Participation

TBD…..

COVID-19 Epidemiology Projects

Instructions

- **Project #1: Developing a Basic Epidemic Curve**
- **Due: April 9, 2020**
- Identify reliable resources for data regarding the timeline and case detection for SARS CoV-2 and COVID-19 in Utah and New York.

- Using the most recent epidemiologic data from these resources, develop basic epidemic curve (Epi Curve) for the states of New York and Utah for COVID-19 (two curves required).
    - Resources for Constructing and Epi Curve
        - https://nciph.sph.unc.edu/focus/vol1/issue5/1-5EpiCurves_issue.pdf
        - https://epiville.ccnmtl.columbia.edu/sars_outbreak_study_2/data_analysis.html
        - https://www.cdc.gov/csels/dsepd/ss1978/lesson1/section11.html
        - A Different Way to Chart the Spread of Coronavirus. Kenneth Chang. The New York Times, March 20, 2020.
- Submit your 1st draft Epi Curves for the states of New York and Utah to Canvas by 5:30 PM, Thursday, April 9, 2020.

- **Project #2: Interpreting Basic Epidemic Curves in Real Time**
- **Due: April 30, 2020**
- Update your Epi Curves weekly throughout the duration of this course.
- Based on your best interpretation of your Epi Curves for New York and Utah, answer each of the following questions (No fewer than 2,500 characters without spaces)
    - How did you choose your data sources?
    - What challenges did you encounter in identifying or collecting reliable COVID-19 data?
    - What is your best explanation for the means of transmission for SARS CoV-2?
    - What is your estimate for when the first cases were exposed in New York? Utah?
    - What is your best estimate of the incubation period for SARS CoV-2?
    - Did COVID-19 behave more like a point source epidemic, a continuous epidemic, a propagated epidemic or a mixed epidemic in New York? Utah?
    - How did the Epi Curve change over time for New York? Utah?
- Submit your updated and final Epi Curves for the states of New York and Utah and your responses to the above questions to Canvas by 5:30 PM, Thursday, April 30, 2020.

Grading System

Students will receive a final letter grade of PASS (P) or FAIL (F) for this course:

PASS: A student who achieves all of the criteria will be assigned a grade of PASS for the course.

FAIL: A student who fails to achieve all of the criteria for PASS will be assigned a grade of FAIL for the course.

Criteria to Pass include: In order to pass this course students are required to do the following:

1. Achieve a minimum of 80% average on the basic knowledge quizzes
2. Participate in the course discussion using the Canvas discussion board
3. Must complete all aspects of the COVID-19 epidemiology project

Student Feedback

Providing feedback is an important aspect of your professionalism expectation, and helps with our curriculum quality improvement process. Your elective course director or coordinator will inform of you of any course feedback surveys. Surveys must be completed by the due date to demonstrate reliability for the professionalism competency.

Standard Policies

Please refer to the Student Handbook (on the Student Affair's website) for these policies:

Accommodations

Addressing Sexual Misconduct
Dress Code
Examination and Grading Policies
Grade or Score Appeal
Professionalism, Roles & Responsibilities
Mistreatment
Infectious, Environmental and Bloodborne Pathogen Exposures Policy

Alternate Name and/or Personal Pronoun

Class rosters are provided to the instructor with the student's legal name as well as 'Preferred' first name (if previously entered by you in the Student Profile section of your CIS account). While CIS refers to this as merely a preference, we will honor you by referring to you with the name and pronoun that feels best for you in class, on papers, exams, group projects, etc. Please advise us of any name or pronoun changes (and please update CIS) so we can help create a learning environment in which you, your name, and your pronoun will be respected.

Center for Disability & Access

The School of Medicine seeks to provide equal access to its programs, services and activities for all medical students. The Center for Disability and Access (CDA) provides accommodations and support for the educational development of medical students with disabilities. Medical students with a documented disability, and students seeking to establish the existence of a disability, that would like to request accommodations are required to meet with the CDA to establish accommodations. The CDA will work closely with eligible students and the Academic Success Program to make arrangements for approved accommodations. The School of Medicine and CDA maintain a collegial, cooperative, and collaborative relationship to ensure compliance with federal and state regulations for students with disabilities.

Steven Baumann EdD, School of Medicine Senior Director of Academic Success Program, serves as the liaison between the School Of Medicine and the CDA.

Contact Information:
Dr. Steven Baumann, Senior Director of Academic Success Program

Safety Statement

The University of Utah values the safety of all campus community members. To report suspicious activity or to request a courtesy escort, call campus police at 801-585-COPS (801-585-2677). You will receive important emergency alerts and safety messages regarding campus safety via text message. For more information regarding safety and to view available training resources, including helpful videos, visit safeu.utah.edu.

Course Topics, Dates & Required Reading/Viewing

1. **COVID-19: Novel Coronavirus (SARS CoV 2) Overview (Previously recorded webinar)**
   - Class instructions
     - For class #1, students must view the webinar titled: *COVID-19: Novel Coronavirus (SARS CoV 2)* To review the webinar that includes an extended Q & A session with Dr. Webb, please click here.
   - Date
     - Tuesday, April 7, 2020, 5:30-7:30 P.M.
   - Instructor(s) & Moderator
     - Guest Instructor: Brandon Webb, M.D., Intermountain Health Care
     - Moderator: Todd Vento, M.D., Intermountain Health Care
   - Expected Learning Outcomes
     - Briefly describe what is known about the family Coronavirdae and human respiratory Coronaviruses
     - Discuss the origin and natural history of the current SARS CoV 2 pandemic
     - Describe what is currently known about SARS-CoV-2 person-to-person transmissibility and infectivity
     - Discuss SARS CoV 2 diagnostic testing in the context of the pandemic
     - List common elements of current suppression and mitigation strategies related to the pandemic
     - Describe the real and potential impact of the COVID-19 epidemic on health systems
     - List known clinical features of COVID-19 and describe potential therapies
     - Discuss various alternative future scenarios regarding the impact of the COVID-19 epidemic and identify the strengths and weaknesses of various suppression and mitigation efforts
   - Required Reading/Viewing
     - The Perpetual Challenge of Infectious Diseases. Anthony Fauci & David Morens. NEJM Review Article, February 2, 2012.
     - The World Changed Its Approach to Health After the 1918 Flu. Will It After The COVID-19 Outbreak? Laura Spinney. Time Magazine, March 7, 2020.

2. **Infectious Disease Epidemiology: A Rapid Overview**
   - Class instructions
     - For class #2, students must review the required reading prior to class.
     - Homework Project #1: Developing a Basic Epidemic Curve is due at 5:30 P.M. prior to start of class.
   - Date
     - Thursday, April 9, 2020, 5:30-7:30 P.M.
   - Instructor(s) & Moderator
     - Guest Instructor: Scott Benson, M.D., University of Utah Health
     - Moderator: Ty Dickerson, M.D., University of Utah Health
   - Expected Learning Outcomes
     - Categorize and classify infectious diseases based on 1) clinical, 2); microbiological and, 3); epidemiologic characteristics of a disease
     - Describe the factors which influence infectious epidemic occurrences and the differences between epidemics, outbreaks, clusters and pandemics
     - Describe various means of transmission for common infectious pathogens and how reservoirs for such pathogens affect the epidemiologic characteristics associated with disease in humans.
       - Means of Transmission
         - Contact
         - Food and/or waterborne
         - Airborne
         - Vector-borne

        - Perinatal
        - Multiple means of transmission (e.g., F. tularemia, Plague, Anthrax)
    - General Reservoirs
        - Human (e.g., Shigella, S. typhi HIV, HBV, HCV)
        - Animal (e.g., rabies, Leptospira, Brucella, Yersinia pestic)
        - Soil (e.g., fungi, Clostridium)
        - Water (e.g., Legionella, Pseudomonas, Mycobacterium marinum)
  - Describe common temporal trends in infectious disease epidemiology, including, seasonal and annual variation, as well as herd immunity, and discuss how these trends influence the epidemiologic profile of an infectious disease.
  - Describe various ways that epidemiologists present epidemiologic data and how such data can inform public health responses to suppress and mitigate the impact of an epidemic.
    - Contact diagrams & epidemic curves
    - Point source vs common/continuous source vs Propagated/person-to-person
    - Endemism vs sporadicism
  - Discuss what the scientific community currently knows about the means of transmission and the reservoirs for SARS CoV-2.
- Required Reading/Viewing
  - https://www.cdc.gov/csels/dsepd/ss1978/lesson1/section11.html
  - https://nciph.sph.unc.edu/focus/vol1/issue5/1-5EpiCurves_issue.pdf
  - https://epiville.ccnmtl.columbia.edu/sars_outbreak_study_2/data_analysis.html
  - A Different Way to Chart the Spread of Coronavirus. Kenneth Chang. The New York Times, March 20, 2020.

3. Coronaviridae 101

- Class instructions
  - For class #3, students must review the required reading prior to class.
- Date
  - Tuesday, April 14, 2020
- Instructor(s) & Moderator
- Guest Instructor: DeVon Hale, M.D., Professor Emeritus, University of Utah Health
- Moderator: Ty Dickerson, M.D., University of Utah Health
- Expected Learning Outcomes
  - List and define various terminology related to the characteristics of human infectious pathogens, including infectivity, pathogenicity, virulence and immunogenicity.
  - Describe the taxonomy and distinguishing features of the viral family *Coronavirdae* and the Subfamily Coronavirinae with a focus on human respiratory Coronaviruses
  - Discuss the morphology, host-virus interaction and replication of human respiratory Coronaviruses
  - Discuss the transmission of human respiratory Coronaviruses and the role of non-human mammals in the evolution of such viruses
  - Describe what is currently known regarding the immune response to human respiratory Coronaviruses, including immune response dysregulation, longevity of the immune response, potential for reinfection, inapparent/asymptomatic infections and carrier states.
- Required Reading/Viewing
  - Coronaviruses: An Overview of Their Replication and Pathogenesis. Anthony R. Fehr and Stanley Perlman. Methods Mol Biol. 2015; 1282: 1–23.

4. **Human Respiratory Coronaviruses & Human Health**

- Class instructions
  - For class #4, students must review the required reading prior to class.
- Date

- Thursday, April 16, 2020, 5:30-7:30 P.M.
- Instructor(s) & Moderator
  - Guest Instructor: Todd Vento, M.D., Intermountain Health Care
  - Moderator: Ty Dickerson, M.D., University of Utah Health
- Expected Learning Outcomes
  - List and describe the common clinical features of and the risk factors for mild, moderate and severe COVID-19 and discuss the pathogenesis of the virus, the primary organ systems involved, high risk populations, and personal risk factors for COVID-19
  - Describe what is currently known about patient outcomes after mild, moderate and severe COVID-19 for various age groups, including pediatric, adult and elderly populations
  - List common diagnostic testing methods for human viral respiratory infections and discuss the relative strengths and weaknesses of various methods, including cell culture, RT-PCR and immunoassays
  - Discuss the current state of the evidence regarding acute and convalescent antibody testing for COVID-19
  - Discuss current recommended strategies for detecting and diagnosing SARS CoV 2 infection in Utah
- Required Reading/Viewing
  - Severe Outcomes Among Patients with Coronavirus Disease 2019 (COVID-19) — United States, February 12–March 16, 2020. MMWR 2020; Early Release Vol. 69 March 18, 2020.

5. SARS CoV-2: Pharmacologic Prevention & Treatment

- Class instructions
  - For class #5, students must review the required reading prior to class.
- Date
  - Tuesday, April 21, 2020, 5:30-7:30 P.M.
- Instructor(s) & Moderator
  - Guest Instructor: Krow Ampofo, M.D., University of Utah Health
  - Moderator: Ty Dickerson, M.D., University of Utah Health
- Expected Learning Outcomes
  - Discuss various pharmacologic means of prevention of SARS CoV 2 infection, including potential prophylactic drugs and vaccines
  - Describe various potential drugs or treatments for COVID-19, including the class of drugs/therapy, the mechanism of action, route of administration, dosing, schedule, and potential side effects or toxicities of the drug or treatment
  - Describe the existing evidence regarding the use of corticosteroids & other anti-inflammatory agents in the clinical management of COVID-19
    - Chloroquine & hydroxychloroquine
    - Remdesivir
    - Lopinavir-ritonavir +/- interferon beta
    - Convalescent IVIG
    - Monoclonal IG
    - Other potential therapies
- Required Reading/Viewing
  - Covid-19 — The Search for Effective Therapy. Lindsey R. Baden & Eric J. Rubin. NEJM Editorial, March 18, 2020.
  - Commentary - Of chloroquine and COVID-19. Franck Touret & Xavier de Lamballerie. Antiviral Res. 2020; Mar 5;177.
  - Assessment of Evidence for COVID-19-Related Treatments. American Society of Health-Systems Pharmacists. March 27, 2020.

6. SARS CoV-2 Containment/Suppression & Mitigation

- Class instructions
  - For class #6, students must review the required reading prior to class.
- Date
  - Thursday, April 23, 2020,5:30-7:30 P.M.
- Instructor(s) & Moderator
  - Guest Instructor: T.W. Jones, M.D., University of Utah Health
  - Moderator: Ty Dickerson, M.D., University of Utah Health
- Expected Learning Outcomes
  - Discuss examples of various public health responses to suppress the SARS CoV 2 pandemic and to mitigate the negative impact of COVID-19, including personal-, household-, community- and regional-level interventions
  - Discuss what is currently known about the aerosol and surface stability of SARS CoV-2 and the utility of environmental management (e.g., decontamination/hygiene) and use of personal protective equipment to prevent human viral respiratory infections
  - Discuss the strengths and limitations of various strategies for SARS CoV 2 and COVID 19 case detection, including syndrome/symptom-based detection, risk factor-based detection and community-wide screening or active surveillance
  - Describe how various suppression and mitigation strategies may influence outcomes from COVID 19, including mortality and health systems impacts
- Required Reading/Viewing
  - Physical interventions to interrupt or reduce the spread of respiratory viruses. Jefferson T, et al. Cochrane Database Syst Rev. 2011 Jul 6;(7):epub.
  - Keeping the Coronavirus from Infecting Health-Care Workers - What Singapore's and Hong Kong's success is teaching us about the pandemic. Atul Gawande. The New Yorker, March 21, 2020.
  - Aerosol and Surface Stability of SARS-CoV-2 as Compared with SARS-CoV-1. Neeltje van Doremalen, et al. NEJM Commentary, March 17, 2020.
  - A cluster randomised trial of cloth masks compared with medical masks in healthcare workers. MacIntyre CR, Seale H, Dung TC, et al. BMJ Open 2015; 5:e006577.

7. Mental Health and Wellness & the COVID-19 Pandemic

- Class instructions
  - For class #7, students must review the required reading prior to class.
- Date
  - Tuesday, April 28, 2020,5:30-7:30 P.M.
- Instructor(s) & Moderator
  - Guest Instructors Benjamin Chan, M.D., David Sandweiss, M.D., Trinh Mai,M.S.W., University of Utah Health
  - Moderator: Ty Dickerson, M.D., University of Utah Health
- Expected Learning Outcomes
  - Discuss what is known about the negative public health impacts associated with social and economic crises, including exacerbation of mental health conditions, domestic violence/abuse, suicide and substance use disorders.
  - Describe clinical and public health measures to mitigate and manage the negative public health impacts associated with social and economic crises
  - Discuss the impact of a health crises on the health and mental health of front-line health care workers, identify signs of anxiety or stress in health care workers and describe measures that can contribute to improved wellness among health care workers during crises.
- Required Reading/Viewing
  - Margerison-Zilko C, Goldman-Mellor S, Falconi A, Downing J. Health Impacts of the Great Recession: A Critical Review. Curr Epidemiol Rep. 2016;3(1):81–91.
  - Doctors and nurses are risking their mental health for us. Sigal Samuel. Vox March 26, 2020.

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8. **COVID-19 in Underserved Populations**
   - Class instructions
     - For class #8, students must review the required reading prior to class.
     - Homework *Project #2: Interpreting Basic Epidemic Curves in Real Time* is due at 5:30 P.M. prior to start of class.
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   - Date
     - Thursday, April 30, 2020,5:30-7:30 P.M.
   - Instructor(s) & Moderator
     - Guest Instructor: David Sandweiss, M.D., Michael Magill, M.D., University of Utah Health
     - Moderator: Ty Dickerson, M.D., University of Utah Health
   - Expected Learning Outcomes
     - Describe what is currently known about the impact of COVID-19 among rural populations & health systems in Utah
     - Describe the challenges to rural health systems in regards to preparedness for COVID-19 in rural communities.
     - Using the Indian Health Services recent experience in the Navajo area of the southwest United States, describe what is currently known about the impact of COVID-19 among tribal populations & tribal health systems.
     - Discuss the unique elements of the COVID-19 pandemic in regards to the potential impact among homeless populations, including transmissibility and health impacts.
   - Required Reading/Viewing
     - The coronavirus may hit rural America later — and harder. Leslie Parshley. Vox, March 28, 2020.
     - The coronavirus is exacerbating vulnerabilities Native communities already face. Maria Givens. Vox, March 25, 2020.
     - COVID-19: a potential public health problem for homeless populations. Jack Tsai & Michael Wilson. Lancet Public Health; Open Access Published: March 11, 2020.

9. Ethics & the COVID-19 Pandemic
   - Class instructions
     - For class #9, students must review the required reading prior to class.
   - Date
     - Tuesday, May 5, 2020, 5:30-7:30 P.M.
   - Instructor(s) & Moderator
     - Guest Instructor: Gretchen Case, Ph.D., M.A., University of Utah Health
     - Moderator: Ty Dickerson, M.D., University of Utah Health
   - Expected Learning Outcomes
     - Discuss the roles and responsibilities of physicians in confronting a public health crisis such as COVID-19
     - Discuss potential ethical issues surrounding the rationing of clinical care resources and personal protective equipment when health systems become overwhelmed with hospital and critical care patients
     - Compare and contrast the obligations that front line health care workers have in relation to their patients, family and community during an infectious disease epidemic.
     - Describe the ethical considerations for conducting clinical trials research during an infectious disease epidemic
   - Required Reading/Viewing
     - Fair Allocation of Resources in the Time of COVID 19. Ezekiel J. Emanuel, et al. NEJM, March 23, 2020.
     - The Toughest Triage — Allocating Ventilators in a Pandemic. Robert D. Truog, et al. NEJM Perspective, March 23, 2020.

- What Happens If Health-Care Workers Stop Showing Up? Thomas Kirsch. The Atlantic, March 24, 2020.
- In a Pandemic, Do Doctors Still Have a Duty to Treat? Sandeep Jauhar. New York Times, April 2, 2020.