**Department of Epidemiology and Population Health**

**EPHD 300**

**Principles of Epidemiology**

**[2 Credits]**

**Course Syllabus**

**Fall Semester, Academic Year 2023-2024**

**Class time and Venue:**

**Common Lecture:** Wednesdays 3:30- 4:45 PM in Van Dyck Auditorium

**Lab Session B1:** Tuesdays 5:30-7:30 PM in Van Dyck building, Room 103

**Lab Session B2:** Tuesdays 9:00-11:00 AM in Van Dyck building, Room 103

**Course Instructors and Contact Details:**

Dr. Lilian A. Ghandour (PhD, MPH)

Associate Professor/PhD Epi program coordinator

Van Dyck Bldg., 3rd floor, room 219

Email: lg01@aub.edu.lb

Office hours: Email instructor

**Course Description:**

This course introduces graduate students to the basic principles and methods of epidemiology and the application of the epidemiological approach to public health research, policy and practice. The course consists of weekly lectures and practical application sessions. Students will learn about the rubrics of Epidemiology, dynamics of disease transmission, common sources of epidemiological data, measures of morbidity and mortality, observational study designs, measures of association, biases and confounding, and general principles of causation in epidemiology. The main concepts will be covered during the lecture. The application sessions (e.g., problem-solving exercises, case studies, journal critiques, mapping…) will allow students to apply their acquired epidemiological knowledge and understand the role of epidemiological evidence in current practices of public health policy and practice.

**Course learning Objectives**

**By the end of the course, students will be able to:**

**LO1.** Describe the role of epidemiology and its rubrics in advancing public health knowledge, policy and practice

**LO2**. Explain the dynamics of communicable disease transmission and steps of outbreak investigation

**LO3**. Evaluate key sources of epidemiological data for their use in public health planning and research

**LO4**. Calculate and interpret measures of morbidity and mortality by person, place and time

**LO5**. Differentiate between common observational epidemiological study designs

**LO6**. Calculate and interpret measures of risk association for public health research policy or practice

**LO7**. Evaluate associations based on the guidelines of causation in epidemiology

**LO8**. Discuss the consequences of biases and confounding on causal inference

**LO9**. Identify common ethical issues and considerations in epidemiological research

**LO10**. Critically appraise an epidemiological published article

**Council on Education for Public Health (CEPH) Core Competencies mapped to EPHD 300**

* **CC1.** Apply epidemiological methods to the breadth of settings and situations in public health practice
* **CC4.** Interpret results of data analysis for public health research policy or practice

**Essential Skills**

* **Essential Skill 1: Study skills**
* **Essential Skill 2: Academic Integrity and Plagiarism**
* **Essential Skill 3: Academic Reading**
* **Essential Skill 4: Critical Thinking/analysis**
* **Essential Skill 5: Problem-solving**
* **Essential Skill 6: Public Health Ethics (research ethics)**

**Link to** [**PHEO Faculty Portal**](https://sites.aub.edu.lb/fhspheo/coursedevelop/)

**Course Learning Objectives mapped to CEPH Core competencies**

 **Table 1. Mapping of course LO to CEPH Core competencies**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **LO1** | **LO2** | **LO3** | **LO4** | **LO5** | **LO6** | **LO7** | **LO8** | **LO9** | **LO10** |
| **CC1.** Apply epidemiological methods to the breadth of settings and situations in public health practice | X | X | X | X | X | X |  |  | X | X |
| **CC4.** Interpret results of data analysis for public health research policy or practice |  |  |  | X | X | X | X | X | X | X |

**Assigned Text Book and Readings (if applicable)**

**Gordis L. Epidemiology. Philadelphia: Pennsylvania, WB Saunders Co.; 2013 6th edition.**

* AUB libraries e-books <https://www.clinicalkey.com/#!/browse/book/3-s2.0-C20160022520>
(you have to be on campus to access this or VPN)

It is **required** to have read any assigned chapter for the lecture **PRIOR** to coming to class. This will maximize the learning experience and enrich class discussions. For in-class application sessions, you may be asked to complete a reading at home before class; application questions will be based on that reading.

**Other Useful Online Resources** (recommended)

To learn more of Epidemiology, an extensive list of resources, including free downloadable e-textbooks and online training, can be found at

* Online epidemiology course <http://www.pitt.edu/~super1/>
* Free downloadable e-textbook <http://www.epidemiolog.net/>
* Free online training <https://www.coursera.org/jhu>
* OpenEpi (<http://www.openepi.com/Menu/OE_Menu.htm>) open-source program works like a calculator where summary information is provided and calculations performed
* Epi Info (<https://www.cdc.gov/epiinfo/index.html>): statistical package for data entry and analysis

*Additional Suggested Instructions:*

The course will also use an assortment of educational resources including: publications, reports, white papers, videos and case studies. All course readings, except for book chapters, will be posted on Moodle according to the weekly topic and reading schedule. It is the responsibility of students to access the Moodle and download/ print the course readings as per the weekly schedule.

**Course requirements and Student evaluation:**

**Pre-requisites:** There are no pre-requisites for this course.

**Student Evaluation:**

**Table-2 Summary of students' assessments mapped to course learning objectives**

|  |  |
| --- | --- |
|  | Learning Objectives |
|  | LO1 | LO2 | LO3 | LO4 | LO5 | LO6 | LO7 | LO8 | LO9 | LO10 |
| Exam 1 | X |  | X | X |  |  |  |  |  |  |
| Exam 2 |  | X |  |  | X | X | X | X |  |  |
| Applications | X | X | X | X | X | X | X | X |  |  |
| Assignment 1  | X |  | X | X |  |  |  |  |  |  |
| Assignment 2 |  | X |  |  | X | X | X | X |  |  |
| Assignment 3 |  |  |  |  |  |  |  |  | X | X |

**Table -3 Description of Assessment methods, Due Dates and Corresponding Learning Objectives**

| **Assessment method** | **Date**  | **Grade %e**  |
| --- | --- | --- |
| ***Exam 1*** | Week of October 9th (TBD) | *25%* |
| Exam 1 may include problem-solving questions and case studies to assess your ability to identify the rubrics of epidemiology, calculate the common measures of morbidity and mortality, conduct an outbreak investigation, and interpret epidemiological findings in ways to inform future research or policy and practice. Data used for calculations and problem solving will be extracted from published literature to illustrate the use of epidemiological evidence in breadth of settings and situations of public health practice. Students are expected to take exam 1 on the scheduled date and time. Make up examinations are not allowed except under very unusual and convincing circumstances. Students who fail to take the examinations on the scheduled date without a written permission of the coordinator will receive an F on the examination. **Exam 1 will be an in-person exam. It will cover module 1 material.**  |
| ***Exam 2*** | *Scheduled by Registrar office*  | *25%* |
| Exam 2 will include problem-solving questions and case studies to assess your ability to differentiate study designs, calculation common measures of association and interpret epidemiological findings in ways to inform future research or policy and practice. The questions will also try to assess student ability to identify main biases, describe potential consequences on the conclusions, as well as highlight major ethical issues and possible ways to address them. Data used for calculations and problem solving will be extracted from published literature to illustrate the use of epidemiological evidence in breadth of settings and situations of public health practice. Students are expected to take exam 2 on the scheduled date and time. Make up examinations are not allowed except under very unusual and convincing circumstances. Students who fail to take the examinations on the scheduled date without a written permission of the coordinator will receive an F on the examination. **Exam 2 will be an in-person exam. It will cover module 2 material.**  |
| ***Applications*** | *Check Detailed schedule below* | *5%* |
| Each application is a set of questions allows students to apply what they have learnt in the preceding lecture material. It also prepares students for the graded assignments and exams. The application will be uploaded on Moodle prior to the application session. Students will have a chance to review the questions and work on them individually before their lab session. During their assigned lab session, students will have an opportunity to discuss the questions/their answers with their colleagues. Students will also be expected to share their answers, and the discussion will be moderated by the course instructor. The KEY to the application will be uploaded on Moodle. **The applications are not graded**, but 5% is assigned for just submission and a **clear effort** to have answered the questions seriously and comprehensively.  |

| **Assessment method** | **Date**  | **Grade %e**  |
| --- | --- | --- |
| ***Three assignments*** | *Assignment 1 – October 3 (in class)**Assignment 2 – Take home Nov 20 due Nov 23**Assignment 3- Nov 29 (in class)* | *15% each)* |
| Each assignment will focus on selected learning objectives as shown above. I will provide you with rubrics and guidelines for all 3 assignments ahead of time. Data used for calculations and problem solving will be extracted from published literature to illustrate the use of epidemiological evidence in breadth of settings and situations of public health practice. Assignment 3 will be a comprehensive assessment of your understanding of all LOs, via a critical appraisal of a published article, which necessitates that you apply the epidemiological methods you learnt. **Delays in submission will result in a 10% penalty if submitted later than the deadline same day and 20% penalty if submitted the following day. Assignments will not be graded if submitted later than one day following the deadline.** |

**Policies and other General Notes:**

**Academic Integrity:**

Plagiarism is a serious breach of academic regulations and integrity, and will not be tolerated. All of the below are considered acts of cheating and will be penalized.

* Working with other students when professor instructed you not to
* Working with someone other than your lab partner (when instructed to work only with lab partner)
* Copying someone’s work in any shape or form
* Attempting to retrieve/using previous solutions to lab problem sets or exams etc.

If you are not sure whether an act is considered cheating or plagiarism or violating academic integrity, please consult with the professor /course instructor for clarity.

Please check the following links for more information. Plagiarism. University of Oxford.
Available from: <https://www.ox.ac.uk/students/academic/guidance/skills/plagiarism> [Accessed on 25-01-2021].

Avoiding Plagiarism, MIT. Available from: <https://integrity.mit.edu/handbook/academic-writing/incorporating-words-and-ideas-others> [Accessed on 25-01-2021].

**Important:** The American University of Beirut has a strict anti-cheating and anti-plagiarism policy. Students will be penalized for cheating and plagiarism, as they are not tolerated. Penalties include failing marks on the assignment in question, failing the course, suspension or expulsion from University and a permanent mention of the disciplinary action in the student’s records.

**Students with Disabilities:**

Staff members of the AUB Office of Student Affairs, Room 113, West Hall, coordinate accommodations and services for students with special needs. If you have a disability, for which you may request accommodation in AUB classes, consult the website for more information and arrange with the Coordinator (<https://www.aub.edu.lb/SAO/Pages/Accessible-Education.aspx>). Also, please see the instructor of this course privately about possible support services that can be provided to you.

**Non-Discrimination-Title IX-AUB:**

AUB is committed to facilitating a campus free of all forms of discrimination including sex/gender-based harassment prohibited by Title IX. The University’s non-discrimination policy applies to, and protects, all students, faculty, and staff. If you think you have experienced discrimination or harassment, including sexual misconduct, we encourage you to tell someone promptly. If you speak to a faculty or staff member about an issue such as harassment, sexual violence, or discrimination, the information will be kept as private as possible, however, faculty and designated staff are required to bring it to the attention of the University’s Title IX Coordinator. Faculty can refer you to fully confidential resources, and you can find information and contacts at www.aub.edu.lb/titleix. **To report an incident**, contact the University's Title IX Coordinator Trudi Hodges at 01-350000 ext. 2514, or titleix@aub.edu.lb. An anonymous report may be submitted online via EthicsPoint at www.aub.ethicspoint.com.

**Accessible Education Office (AEO):**

The Accessible Education Office (AEO) coordinates academic accommodations and services for all eligible AUB students with disabilities (such as ADHD, learning difficulties, mental health conditions, chronic or temporary medical conditions, and others). If you have a disability for which you wish to request accommodations at the department, faculty or university level, please contact AEO as soon as possible. Once you register with our office, we will assist you in receiving appropriate accommodations and will liaise with your instructors and any related entity to best support your needs. AEO is located in West Hall room 314, and can be reached by phone at 1-350000 ext. 3246 or by email: accessibility@aub.edu.lb. Information about our services can be found at: [https://www.aub.edu.lb/SAO/Pages/Accessible-Education.aspx\](https://www.aub.edu.lb/SAO/Pages/Accessible-Education.aspx%5C)

**Writing:**

Written communication is essential for communication, health education and behavioral science. You are expected to proofread and spell-check any written documents before submission. Points will be deducted from the grades for low quality writings. You are encouraged to contact AUB’s Writing Center, located in Ada Dodge Hall, 2nd floor or West Hall, 3rd floor. Appointments can be booked online: aub.mywconline.com, over the phone (Ext. 4077) or by walking in.



**Public Health Education Office**

Please refer to the Public Health Education Office Student Portal

**Detailed course outline:**

**For University Holidays:** [**Calendar**](https://www.aub.edu.lb/Registrar/Documents/calendar2022-23-scheme.pdf)

| **Sessions** | **Date of Lecture** | **Topic** | **Course LO** | **Required chapter**  | **Assessment**  |
| --- | --- | --- | --- | --- | --- |
| Session 1 | Wed. Aug 30 | **Introduction to the course/syllabus/students** | LO1 | Ch 1 | ----- |
| Tues Sept 5 | **Introduction to Epidemiology (repeated twice that day)** |
|  |  |  |  |  |  |
| Session 2 | Wed Sept 6 | **Measures of Morbidity & Sources of Morbidity Data-1** | LO3-LO4 | Ch 3 | Assignment 1Exam 1 |
| Tues. Sept 12 | Application 1 – Epi Rubrics/Morbidity Measures  |
|  |  |  |  |  |  |
| Session 3 | Wed Sept 13 | **Measures of Mortality & Sources of Mortality Data**  | LO3-LO4 | Ch 4 | Assignment 1Exam 1 |
| Tues. Sept 19 | Application 2 – Mortality Measures  |
|  |  |  |  |  |  |
| Session 4 | Wed. Sept 20 | **Direct and indirect standardization**  | LO3-LO4 | Ch 3 | Assignment 1Exam 1 |
| Tues. Sept 26 | Application 3 – Direct and indirect standardization  |
|  |  |  |  |  |  |
| Session 5 | Wed. Sept 27 | **NO CLASSES- PROPHET’s BIRTHDAY** | --- | --- | --- |
| Tues. Oct 3 | **Assignment #1 – Applications 1/2/3** |
|  |  |  |  |  |  |
| Session 6 | Wed. Oct 4 | **Dynamics of CD transmission/Outbreak Investigation** | LO2 | Ch 2  | Assignment 2Exam 2 |
| Tues. Oct 10 | Application 4- Outbreak Investigation  |
|  |  |  |  |  |  |
| Session 7 | Wed. Oct 11 | **Cross-sectional studies**  | LO4 | Ch 4/7 | Assignment 2Exam 2 |
| Tues. Oct 17 | Application 5– Cross-sectional (questions on articles) |
|  |  |  |  |  |  |
| Session 8 | Wed. Oct 18 | **Case-Control Studies**  | LO5-LO6 | Ch 9 | Assignment 2Exam 2 |
| Tues. Oct 24 | Application 6- Case-control studies (questions on articles) |
|  |  |  |  |  |  |
| Session 9 | Wed. Oct 25 | **Cohort studies**  | LO5-LO6 | Ch 8 | Assignment 2Exam 2 |
| Tues. Oct 31 | Application 7- Cohort studies (questions on articles) |
|  |  |  |  |  |  |
| Session 10 | Wed. Nov 1 | **Measures of Association: OR, RR, AR and linkages** | LO5-LO6 | Ch 12/13 | Assignment 2/3Exam 2 |
| Tues. Nov 7 | Application 8 – Measures of association (Calculation) |
|  |  |  |  |  |  |
| Session 11 | Wed. Nov. 8 | **Confounding**  | LO7-LO8 | Ch 14/15 | Assignment 2/3Exam 2 |
| Tues. Nov 14 | Application 9- Confounding (calculation/article) |
|  |  |  |  |  |  |
| Session 12 | Wed. Nov 15 | **Biases & Guidelines for Assessing Causality** | LO8L09-L10 | Ch 14/15  | Assignment 2/3Exam 2 |
| Tues. Nov 21 | **Ethics/Critical appraisal of articles**  |
|  |  |  |  |  |  |
| Session 13 | Wed. Nov 22 | **NO CLASSES- INDEPENDENCE DAY** | LO8L09-L10 | Ch 20 | --- |
| Tues. Nov 29 | **Assignment 3– Comprehensive (all applications)** |

\*A VOP on RCTs will be shared for those interested – questions will be answered via MOODLE discussion forum – this will not be assessed in the exam.

**Appendix I. Reinforced – Introduced CEPH competencies**

Introduced competencies: the competency is introduced at a basic level. Instruction and learning activities focus on basic knowledge, skills and entry-level complexity. The competency is **not assessed**

Reinforced competency: The competency is reinforced with feedback; students demonstrate the outcome at an increasing level of proficiency (above the introductory stage). Instruction and learning activities concentrate on enhancing and strengthening existing knowledge and skills, as well as expanding complexity. The competency is **not assessed**

| **Core Competencies** | **Introduced** | **Reinforced** |
| --- | --- | --- |
| CC2. Select quantitative and qualitative data collection methods appropriate for a given public health context |  | X |
| CC3. Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming and software, as appropriate |  | X |
| CC7. Assess population needs, assets and capacities that affect communities’ health |  | X |
| CC8. Apply awareness of cultural values and practices to the design or implementation of public health policies or programs |  | X |
| CC12. Discuss multiple dimensions of the policy-making process, including the roles of ethics and evidence |  | X |
| CC21. Integrate perspectives from other sectors and/or professions to promote and advance population health |  | X |
| CC22. Apply systems thinking tools to a public health issue |  | X |
| **HPCH competencies** |  |  |
| HPCHCC1. Demonstrate a critical understanding of multidisciplinary theories/frameworks utilized in health promotion research and practice  |  | X |
| HPCHCC3. Conduct rigorous quantitative and qualitative research for health promotion  |  | X |
| HPCHCC4. Use participatory approaches in community health programs and research  |  | X |
| HPCHCC5. Promote social justice and equity in health promotion research, practice, and policy  |  | X |
| **EPHD competencies** |  |  |
| EBCC1: Discuss the extent, distribution and determinants of common and emerging communicable and non-communicable diseases, and mental health disorders of local, regional and global importance |  | X |
| EBCC2: Discuss prevention and control strategies/programs for common and emerging communicable and non-communicable diseases and mental health disorders |  | X |
| EBCC3: Design epidemiological studies to investigate public health research questions |  | X |
| EBCC5: Apply inferential statistics and advanced statistical approaches such as regression modelling to analyze complex health related data |  | X |
| EBCC6: Interpret and communicate statistical findings in oral and written format |  | X |
| EBCC8: Appraise the quality of epidemiological evidence by evaluating studies for bias and other sources of systematic errors |  | X |