

**GEORGE MASON UNIVERSITY**  
**College of Health and Human Services**

**Course Number:** GCH 712-002 (Lecture)

**Course Title:** **Introduction to Epidemiology**

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**Course Description:** Introduction to epidemiology and health service research includes a body of knowledge and methods for analyzing health problems. Students learn the role of health services research and epidemiology in health policy, health service delivery and planning, and evidence-based management and clinical practice. Students design epidemiological studies, analyze secondary data, develop their own judgment when analyzing evidence and evaluate impact of programs on health outcomes.

**Course objectives:**

Upon completion of this course the student will be able to:

1. Understand the application of epidemiology in clinical, public health and health service settings, and especially in the field where the student is or plans to be engaged in, either domestic or international.
2. Calculate, interpret and compare measures of disease frequency in populations, and measures of association between exposures and health outcomes.
3. Describe various epidemiological methods used in the study of diseases, health conditions and health promotion behaviors of choice, and the application of epidemiology in such areas as cardiovascular disease, cancer, biological and radioactive threats or disasters, nutrition, aging and gerontology, reproductive and maternal and child health, outbreaks and spread of infections, and the role of epidemiology in health services research.
4. Interpret findings on the natural history, pathophysiology, risk factors and methods specific to the study of the disease or condition the student has chosen.
5. Select appropriate descriptive and analytic epidemiologic methods to investigate and identify risk factors and causes of a disease outbreak.
6. Summarize and interpret epidemiological data, and appropriately interpret associations and make conclusions; identify possible sources of bias and describe methods for minimizing bias; identify possible confounders and effect modifiers and describe methods to adjust for them; and distinguish between association and causation

7. Develop and write a research proposal that demonstrates the student's ability to synthesize the current knowledge and gaps in the study of a specific health problem or condition of choice, and describe appropriate epidemiological methodology including variable selection and data collection and analysis to address a health condition, public health problem or health service improvement.

**Required textbook(s):**

1. Aschengrau and Seage, Essentials of Epidemiology in Public Health, Jones and Bartlett, 2003 or 2007. The book has the basics and the narrative is engaging.
2. Health Research Methodology, WHO, 2001 downloadable here:  
[http://www.wpro.who.int/NR/rdonlyres/3418F27F-60F0-42F3-9409-852F47E09DEF/0/Health\\_research\\_edited.pdf](http://www.wpro.who.int/NR/rdonlyres/3418F27F-60F0-42F3-9409-852F47E09DEF/0/Health_research_edited.pdf)
3. Research Methodology: A Step-by-Step Guide for Beginners (Paperback) by Dr Ranjit Kumar (if you work or intend to work in research, this book has all you need to get started!)

**Other recommended textbook(s):**

- J.H. Abramson, Survey Methods in Community Medicine, Churchill Livingstone, 5<sup>th</sup> edition 1999. This book has short chapters that address all practical aspects of conducting epidemiological research in community medicine.
- Leon Gordis, Epidemiology 3<sup>rd</sup> Edition;
- J H Abramson, Making sense of data;
- John Last, A Dictionary of Epidemiology;
- Online textbook: Epidemiology for the Uninitiated:  
<http://bmj.bmjournals.com/collections/epidem/epid.html>
- David Bowers, Medical Statistics from Scratch: An Introduction for Health Professionals, Wiley 2008

**Recommended readings:** The Tipping Point, by Malcolm Gladwell; Milestones in Public Health and The Faces of Public Health (Pfizer); Virus Hunter: 30 years battling hot viruses around the world by C.J. Peters; The BMJ, The Lancet, and the Journal of the American Public Health Association.

**Additional Course Requirements:**

Students are required to check the following websites weekly and be prepared to discuss in class:

<http://www.cdc.gov/>

<http://www.cdc.gov/mmwr/>

<http://www2a.cdc.gov/podcasts/>

<http://www.vdh.state.va.us/>

**Course Evaluation:**

1. Journal 20%
2. Quizzes 10%
3. Project proposal 25%
4. Final exam 20%
5. Class participation 25%

**Journals.** Epidemiology is an empirical discipline and you need to develop your analytical ability to reflect and look for patterns among all the information you are being presented with. You are expected to reflect on what you are learning as you apply it to write your first epidemiological research proposal. You will be required to write and email me a journal entry once a week on your reflections about preparing your first research proposal. Do not ask me how long it has to be, that is up to you. I expect you to be concise when you make your point, though. If you need help writing or English is not your first language, I suggest you visit GMU's Writing Center at <http://writingcenter.gmu.edu/>. There are many resources and free help. Your writing skills will not be graded in this course, but good writing will allow to make the best of journal writing.

**Quizzes and Final Exam.** There will be a mock quiz and two quizzes for students to assess their progress and where they may need to do extra work. You are expected to get full mark on each quiz by resubmitting the correct answers. Quizzes include a number of multiple and open ended questions. The final exam includes a number of open ended questions regarding selected research abstracts or published papers to so the quizzes are good practice.

**Project proposal.** The epidemiological research proposal or protocol you will write will summarize all you have learned about Epidemiology and how you will use what you learned to study a health problem. You will write a research proposal or protocol according to the guidelines provided and you will present your proposal using PowerPoint to convince your classmates to support your study. You will have five minutes to make the case for your proposal. Although you will not be graded for your writing skills, poor writing skills may prevent your instructor from understanding your proposal. Again, visit GMU's writing center!

**Class participation** is measured through attendance and participation in class discussions. You are encouraged to take the lead in various class activities, ask questions, and demonstrate ability to stay up to date with current epidemiological events and the topic of the week.

**I also expect you to show the attributes of "My Perfect Student"**

1. Goal oriented
2. Participative
3. Expresses learning needs assertively
4. Committed to making a difference in public health

5. Entrepreneurial and proactive
6. Reflective
7. Demonstrates sense of humor

**Teaching methods/strategies:**

The course includes various methods: discussion of current epidemiological events, lecture, “1 Minute” oral presentations, group discussion, reading and discussion of epidemiological papers and public health reports, journals, use of PowerPoint to present a research plan, and extra credit assignments.

**Seven Tips to Succeed in this Course:**

1. Email anytime, particularly when you get an idea or are planning your work.
2. Phone calls are welcome when you are stuck or do not know what to do.
3. Write your journal every week to reflect on the topic of the week and what it means to your epidemiological research. Journals are not public, i.e. what you write is between you and your instructor. Your instructor will ask you for permission if something is worth sharing with the rest of the group in a discussion group.
4. Improve your writing skills. They are essential epidemiological skills. Write every day, even when you do not feel like it. You will get good at it.
5. Participate in every class. It is an excellent opportunity to work on your public speaking skills.
6. Meet all deadlines. Deadlines are not negotiable.
7. Listen actively to understand and not to be understood. Be prepared to ask questions every class.

**Academic Honesty:** George Mason University operates under an honor system, which is published in the University Catalog and deals specifically with cheating, attempted cheating, plagiarism, lying and stealing. Please familiarize yourself with the honor code, specially on plagiarism (<http://www.gmu.edu/facstaff/handbook/aD.html>). If you have questions about when the contribution of others to your work must be acknowledged and appropriate ways to cite these contributions, let me know. I suggest you use the Chicago or the MLA style for citations.

**Students with disabilities:** All students with questions or concerns about this class are encouraged to set up a time to meet me and discuss them, preferably during the first 2 weeks of the semester. Students with disabilities should work with the Disabilities Resource Center (DRC) to identify appropriate accommodations and communicate those to the professor. The DRC handbook is available at <http://www.gmu.edu/student/drc/drcguide.pdf>.

**Course/topical outline:**

Week Starting on	Topics	Readings		Notes
		Aschengrau and Seage	HRM	
1 8/27/08	Introduction to Epidemiology	Chapter 1	Chapter 1	Journal
2 9/3/08	Measuring and Comparing Disease Frequencies	Chapters 2 and 3	Chapter 2	Journal
3 9/10/08	Descriptive Epidemiology: How to investigate an outbreak	Chapter 4 and 5	Chapters 3	Journal Mock Quiz
4 9/17/08	Analytical Epidemiology: cohort and experimental studies	Chapters 6, 7 and 8	Chapters 4	Journal
5 9/24/08	Case control and randomized studies	Chapter 9	Chapter 5 -6	Journal
6 9/24/08	Planning a study	Chapter 10	Chapter 11	Quiz
7 10/10/08	How to write a proposal or application	Handout		Journal
8 10/8/08	Data Collection: How to construct a questionnaire		Annex 1	Journal
9 10/15/08	Epi Info Data Management	Handout	Annex 2	Journal
10 10/29/08	Epi Info Analysis	Handout	Chapters 7 and 8	Quiz
11 11/5/08	Presentations	Your choice!	<a href="http://www.who.int/child-adolescent-health/publications/I/MCI/HFS.htm">http://www.who.int/child-adolescent-health/publications/I/MCI/HFS.htm</a>	Journal
12 11/12/08	Interpreting results: confounding, effect modification and causation	Chapters 11, 12, 13, 14 and 15	Chapters 9 and 10	Journal
13 11/19/08	Health Services Research	Chapter 16	Handout	Journal
14 12/3/08	Global and Community Health	Handout		Journal
15 12/10/08	Final Exam	Study		Celebrate!