Course Title: Cancer Epidemiology

Course Number: EPID 0601

Course Location: SPH Room XXX

Course Date & Time: Tuesdays & Thursdays, 3:10 pm – 6:00 pm

Course Instructor: Adana A.M. LLanos, PhD, MPH
Assistant Professor, Department of Epidemiology
School of Public Health
Rutgers, The State University of New Jersey
683 Hoes Lane West, Room 211
Email: Adana.Llanos@Rutgers.edu
Telephone: 732.235.4017

Office Hours: Tuesdays 9:30 am – 12:00 pm (and by appointment)

Required Course Text: *Textbook of Cancer Epidemiology, 2nd Edition*
Edited by: Hans-Olav Adami, David Hunter and Dimitrios Trichopoulos

Additional/Supplemental Readings/Resources:
- *Cancer Epidemiology and Prevention, 3rd Edition*
  Edited by: David Schottenfeld and Joseph F. Fraumeni
- *Cancer Epidemiology: Principles and Methods. International Agency for Research on Cancer, 1999*
  Author: Isabel dos Santos Silva

Course Description: This course will provide an introduction to cancer epidemiology, highlighting current statistics (in incidence, mortality, and survival) and cancer risk factors (including host and environmental factors). Strategies for cancer prevention and control in the general population and within disproportionately affected populations will also be presented. Additionally, this course will encourage critical thinking about these concepts, covering the use of biomarkers and some controversial topics in cancer epidemiology research. Students will increase their knowledge of cancer epidemiology and obtain the skills needed to interpret and critique research studies in the field of cancer epidemiology.

Selected Department Competencies Addressed: Each Department identifies competencies for each degree offered. The competencies addressed in this course for the MPH and PhD for the Department of Epidemiology include:

- Critique epidemiologic literature, assess its strengths and weaknesses and determine if conclusion(s) are supported;
- Use epidemiologic techniques to quantitatively assess patterns and changes in disease occurrence;
• Formulate a specific hypothesis and determine an appropriate study design and analysis plan;

• Appropriately analyze and interpret epidemiologic data, including large national datasets and state level datasets; and

• Communicate and present study findings to professional audiences

Please visit the Department webpages on the School of Public Health’s website at http://sph.rutgers.edu/ for additional competencies addressed by this course for other degrees and departments.

**Course Objectives:** *By the completion of this course, students will be able to:*

1. Describe the U.S. and global burden of cancer and its impact on public health;
2. Explain international patterns of cancer incidence, mortality, and survival;
3. Discuss the major known risk factors for several common human cancers and evaluate trends in the prevalence of important etiologic factors;
4. Discuss current modalities for cancer screening and prevention, and evaluate the effectiveness of various strategies for reducing cancer burden;
5. Critique study designs applied in the field of cancer epidemiology, as well as some methodological issues involved in molecular epidemiology studies; and

**Course Requirements and Grading:**

• *Overall class attendance, preparation and participation (10%)*
  - Readings are assigned from the textbook, as well as from the scientific literature. See Course Schedule for due dates (Pgs 3-4) and Assigned Readings List (Pgs 5-7).
  - Study questions based on these readings will be discussed during each lecture.

• *Midterm exam (25%)*
  - A midterm exam will be administered during the regularly scheduled class period of *Lecture 7 (06/10/2014)*. This in-class exam will cover assigned readings and lecture discussions from the first 6 weeks of the course and will be comprised of multiple choice, true-false, and short-answer questions.

• *Written assignment (15%) and 10-15 minute presentation (15%) on a cancer-related topic*
  - Students will select a topic related to cancer epidemiology, prevention or control, on which they will fully research and write a 5-10 page literature review, with a complete list of scientific references. Additionally, students will prepare a 10-15 minute lecture presentation, which they will present to the class during the regularly scheduled class period of *Lecture 14 (07/10/2014)*.
The written assignment will constitute 15% of the final grade and the lecture presentation will constitute 15% of the final grade, for a total of 30%.

Due date: **07/10/2014**

**Final exam (35%)**
- A final exam will be administered on the last day of class (Lecture 15, 07/15/2014) during the regularly scheduled class period. This in-class exam will cover material from assigned readings and lecture discussions throughout the course of the semester (comprehensive) and will be comprised of multiple choice, true-false, and short-answer questions.

**Expectations:** Students are expected to attend and be prepared (by completing the course readings before class) for every class session, as well as to participate during discussions of study questions and other topics. The course also includes a scientific abstract assignment and lecture (a two part assignment) and two exams (a midterm exam and a comprehensive final exam). Students are expected to complete assignments by the due date(s) and to sit for exams at their scheduled time. If a student finds that he/she must miss an exam for a serious reason, please contact the instructor before the date of the scheduled exam to receive permission to reschedule. Similarly, if a student anticipates submitting an assignment late for a serious reason, he/she should contact the instructor before the due date to receive permission and determine an agreed upon date for submission. If no arrangement is made, the assignment that is submitted late will be penalized 5% per day.

**Course Schedule:**

<table>
<thead>
<tr>
<th>Date</th>
<th>Lecture</th>
<th>Topic(s) and/or Activities</th>
<th>Assigned Readings</th>
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<tbody>
<tr>
<td><strong>PART I: CANCER STATISTICS, RISK FACTORS AND PATHOLOGY</strong></td>
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<tr>
<td>05/20/2014</td>
<td>1</td>
<td>Introduction - review of syllabus and requirements</td>
<td><strong>Textbook:</strong> Pgs 3-23</td>
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<td>Overview of cancer epidemiology</td>
<td><strong>Article:</strong> Greenwald P &amp; Dunn BK (2009)</td>
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<td>05/22/2014</td>
<td>2</td>
<td>Global and U.S. burden of cancer</td>
<td><strong>Textbook:</strong> Pgs 34-59</td>
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<td>Cancer statistics (incidence, mortality, and survival)</td>
<td><strong>Articles:</strong> Eheimer C, et al. (2012)</td>
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<td>Selected topics in cancer disparities</td>
<td>**Jemal A, et al. (2013)</td>
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<td>**Smith BD, et al. (2009)</td>
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<td>05/27/2014</td>
<td>3</td>
<td>Cancer etiology/pathologic basis of cancer</td>
<td><strong>Textbook:</strong> Pgs 61-81; Pgs 127-146</td>
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<td>Concepts in cancer epidemiology</td>
<td><strong>Articles:</strong> Hanahan D &amp; Weinberg RA (2000)</td>
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<td>Review of epidemiology study design and examples in cancer epidemiology</td>
<td>**Deininger P (1999)</td>
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<td>**Rothman K &amp; Greenland S (2005)</td>
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<td>05/29/2014</td>
<td>4</td>
<td>Descriptive epidemiology, risk factors and related disparities of selected cancers by site</td>
<td><strong>Textbook:</strong> Chapters 14-23, 11</td>
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<td>· Lung</td>
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<td>· Melanoma of the skin</td>
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<td>· Breast</td>
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<td>· Female reproductive</td>
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<td>· Prostate &amp; testicular</td>
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<td>· Urinary bladder &amp; kidney</td>
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<td>· Colorectal &amp; GI tract</td>
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| 06/03/2014 | 5   | Descriptive epidemiology, risk factors and related disparities of selected cancers by site  
- Head & neck  
- Esophageal  
- Stomach  
- Liver  
- Pancreatic  
- Brain  
- Thyroid  
- Non-Hodgkin lymphoma  
- Leukemias  
- Childhood cancer | Textbook: Chapters 7-10; 12-13; 24-28 |
| 06/05/2014 | 6   | Guest Lecturer: Dr. Antoinette "Nan" Stroup  
Cancer registries and surveillance programs for collection of incidence data and the associated challenges  
- New Jersey State Cancer Registry (NJSCR)  
- Surveillance and Epidemiology and End Results (SEER)  
- Cancer data sources and publicly available research databases  
- Data analysis exercise(s) | TBD |
| 06/10/2014 | 7   | IN-CLASS MIDTERM EXAM | Review assigned readings and course lecture notes |
|            |     | PART II: MOLECULAR EPIDEMIOLOGY AND CANCER PREVENTION | |
| 06/12/2014 | 8   | Introduction to molecular epidemiology of cancer  
- Types and uses of biomarkers in cancer epidemiology studies  
- Selected methodological issues in cancer/molecular epidemiology  
Examples of recent molecular epidemiology studies | Textbook: 109-123 |
|            |     | Articles:  
Schiffman MH (1994)  
Yang G (2010)  
Gross AL (2013)  |
| 06/17/2014 | 9   | Recent findings from my molecular epidemiology research related to obesity, adipokine biomarkers and breast cancer prevention | Articles:  
Llanos AA, et al. (2012)  
Llanos AA, et al. (2014) (2) |
| 06/19/2014 | 10  | Principles and practices in cancer prevention  
- Cancer prevention and control in the general population  
- Cancer prevention and control among high risk sub-groups | Articles:  
Jha P (2009)  
Bagnardi V, et al. (2013) |
| 06/24/2014 | 11  | Targeting behavioral and environmental risk factors for cancer prevention  
Discussion of modifiable and non-modifiable cancer risk factors | Articles:  
Anderson AS, et al. (2013)  
White MC, et al. (2013) |
| 06/26/2014 | 12  | Guest Lecturer: Dr. Susan Goodin  
Cancer chemoprevention  
*Review of requirements for written assignment and presentations (Due 07/10/2014) | Articles:  
Chan AT, et al. (2012)  
Langner E & Rzeski W (2012)  
Saldanha SN & Tollefsbol (2012) |
|            |     | PART III: COURSE WRAP-UP | |
| 07/01/2014 |     | LECTURE CANCELLED | |
| 07/03/2014 |     | LECTURE CANCELLED | |
| 07/08/2014 | 13  | Discussion of current controversial topics in cancer and/or molecular epidemiology  
Cancer Epidemiology Jeopardy (Review for Final Exam) | Current media articles (TBD) |
| 07/10/2014 | 14  | Student Presentations | NONE |
| 07/15/2014 | 15  | IN-CLASS FINAL EXAM | Review assigned readings and course lecture notes |
Assigned Readings List:

LECTURE 1:
Textbook: Chapter 1, Pages 3-23

Article:

LECTURE 2:
Textbook: Chapter 2, Pages 34-59

Articles:

LECTURE 3:
Textbook: Chapter 3, Pages 61-81; Chapter 6, Pages 127-146

Article:

LECTURE 4:
Textbook: Review sections on the epidemiology and risk factors of lung cancer (Chapter 14, Pages 357-367), skin cancer (Chapter 15, Pages 385-394), breast cancer (Chapter 16, Pages 408-434), cervical cancer (Chapter 17, Pages 450-461), endometrial cancer (Chapter 18, Pages 474-485), ovarian cancer (Chapter 19, Pages 499-510), prostate cancer (Chapter 20, Pages 525-541), testicular cancer (Chapter 21, Pages 559-587), bladder cancer (Chapter 22, Pages 580-589), kidney cancer (Chapter 23, Pages 602-610), and colorectal cancer (Chapter 11, Pages 284-296).

LECTUE 5:
Textbook: Review sections on the epidemiology and risk factors of oral and pharyngeal cancer (Chapter 7, Pages 161-169), nasopharyngeal cancer (Chapter 8, Pages 182-188), esophageal cancer (Chapter 9, Pages 213-225), stomach cancer (Chapter 10, Pages 253-265), liver cancer (Chapter 12, Pages 313-323), pancreatic cancer (Chapter 13, Pages 336-343), brain cancer (Chapter 24, Pages 622-630), thyroid cancer (Chapter 25, Pages 643-648), Hodgkin lymphoma (Chapter 26, Pages 659-664), Non-Hodgkin lymphoma (Chapter 27, Pages 675-685), and leukemias (Chapter 28, Pages 701-709).

LECTURE 6:
*TBD*
LECTURE 7:
Review assigned readings and course lecture notes in preparation for the Midterm Exam.

LECTURE 8:
Textbook: Chapter 5, Pages 109-123

Articles:

LECTURE 9:
Articles:

LECTURE 10:
Articles:

LECTURE 11:
Articles:
LECTURE 12:
Articles:

LECTURE 13:
Select media articles (TBD) and review of course materials for Cancer Epidemiology Jeopardy.

LECTURE 14:
NONE

LECTURE 15:
Review assigned readings and course lecture notes in preparation for the Final Exam.

School of Public Health Honor Code: The School of Public Health Honor Code is found in the student bulletin (sph.rutgers.edu/academics/catalog/index.html). Each student bears a fundamental responsibility for maintaining academic integrity and intellectual honesty in his or her graduate work. For example, all students are expected to observe the generally accepted principles of scholarly work, to submit their own rather than another’s work, to refrain from falsifying data, and to refrain from receiving and/or giving aid on examinations or other assigned work requiring independent effort. In submitting written material, the writer takes full responsibility for the work as a whole and implies that, except as properly noted by use of quotation marks, footnotes, etc., both the ideas and the works used are his or her own. In addition to maintaining personal academic integrity, each student is expected to contribute to the academic integrity of the school community by not facilitating inappropriate use of her/his own work by others and by reporting acts of academic dishonesty by others to an appropriate school authority. It should be clearly understood that plagiarism, cheating, or other forms of academic dishonesty will not be tolerated and can lead to sanctions up to and including separation from the Rutgers School of Public Health.

Policy Concerning Use of Recording Devices and Other Electronic Communications Systems: When personally owned communication/recording devices are used by students to record lectures and/or classroom lessons, such use must be authorized by the faculty member or instructor who must give either oral or written permission prior to the start of the semester and identify restrictions, if any, on the use of mobile communications or recording devices.