

DARWINIAN MEDICINE (BIO350), FALL 2004

<u>Week¹</u>	<u>Topic</u>	<u>Reading²</u>
1 (8/31)	Introduction; Objectives; Assumptions	N-Preface, N1, W1, Z-Intro, Z1, Z2
2 (9/7)	Population genetics	N2, W2 (p. 20-38), Problem Set
3 (9/14)	Selection and adaptation; Systematics (no lecture 9/16)	W2 (p. 39-90), Z3
4 (9/21)	Systematics; Human evolution; Evolutionary legacies	Problem Set, N9
5 (9/28)	Diseases of civilization; MIDTERM I (9/30)	N10
6 (10/5)	Injury; Poisons and toxins	N5, N6
7 (10/12)	Sex and reproduction; Immunology	N13, Z6
8 (10/19)	Immunology (cont.); Allergy	N11, Z7
9 (10/26)	Cancer; Mental disorders	N12, Z8
10 (11/2)	MIDTERM II (11/2); Genetic disease and senescence	N7, N8, N14
11 (11/9)	Infection and evolutionary arms races; Demography	N3, N4, W3 (p. 111-127)
12 (11/16)	Evolution of pathogens & antibiotic resistance	Z4
13 (11/23)	Ecology of Disease; PAPER (DUE 11/23), THANKSGIVING (no lecture 11/25)	Z9
14 (11/30)	Ecology of Disease, AIDS	Z10
15 (12/7)	Lyme disease	Z5, Z11, Z- conclusion

(12/16) **FINAL EXAM**, 11:00 – 1:30 pm

¹Dates in parentheses are the Tuesday of each week. ²Chapters in Nesse and Williams (N), Wilson and Bossert (W), or Zimmerman and Zimmerman (Z). Reading assignments should be completed by Tuesday of the week in which they are assigned.

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Instructors and Office Hours: Michael A. Bell (Life Sciences 023; Tu & W 2:30 – 3:30; email: mabell@life.bio.sunysb.edu), Daniel K. Dykhuizen (Life Sciences 638; Tu & W 2:30 – 3:30; email: dandyk@life.bio.sunysb.edu), and Jeff Yule (Life Sciences 677; Tu & Th 10:55-11:55; email: jyule@life.bio.sunysb.edu), Department of Ecology and Evolution. We will hold office at the times indicated, but you can talk to us in lecture to make an appointment for another time.

Course Rationale: Human pathology has proximate causes that depend on genetic, physiological, developmental, and behavioral mechanisms. Pathology also has ultimate causes that depend on evolutionary mechanisms. Thus, Darwinian medicine poses questions about the evolutionary history of pathology and how the proximate causes for pathology have evolved. For example: why are some groups of people likely to get sickle-cell anemia, why do food plants contain toxins, and why are we all prone to choke on our food? We can gain insights into human pathology by studying both types of causation, but medicine has traditionally emphasized proximate causation.

In recent years, interest in the ecology and evolution of interactions between hosts and their parasites and pathogens has grown. The evolutionary causes of degenerative diseases, including senescence and cancer are being studied. The objective of this course is to introduce the concepts needed to understand human pathology in terms of ultimate causes. We will discuss human evolution and the evolution of human pathogens. Appreciation of the ultimate causes for pathology may lead to new strategies for disease prevention and therapy.

Prerequisites: We assume that students have had an introduction to biological diversity, classification, evolution, ecology, molecular and Mendelian genetics, and cell and animal physiology.

Reading: Reading is assigned from the following four texts:

Nesse, R. M. and G. C. Williams. 1996. *Why We Get Sick*. Vintage, New York.

Wilson, E. O. and W. H. Bossert. 1971. *A Primer of Population Biology*. Sinauer, Sunderland.

Zimmerman, B. E. and D. J. Zimmerman. 2003. *Killer Germs*, Revised and Updated. Contemporary Books, Chicago.

These books may be purchased at **Stony Books** (across the street from the LIRR station, on 25A) but not at the campus bookstore. Reading assignments should normally be completed by Tuesday of the week in which they are listed in the lecture schedule.

Examinations, Paper, and Grading: Grades will be based on 700 points, distributed as follows:

Midterm I (Tuesday, September 30)	100
Midterm II (Thursday, October 30)	200
Paper (Tuesday, November 25)	100
Final Exam , Tuesday, December 16)	300

Midterms will be based on all information presented in prior lectures, except for the last lecture before the midterm plus all reading assigned for the period since the previous midterm, including the week of the exam. The second midterm will have 50 points of review questions on lecture material, and the final exam will include 100 points divided between material from the first two thirds of the course. There will be relatively few questions on the assigned reading (5-15% of points), and they will be general enough to be answered after a single attentive reading of the texts. Midterms will be designed to take about one hour, and answers will be written directly on the test sheets. Most answers will be a few words or sentences.

Midterms will normally be returned at the end of the second lecture after the exam. When you receive your midterm, check the addition of the score and request corrections of addition errors immediately. Then compare your answers to the grading key posted outside Mike Bell's office and on the course web page. See the Jeff Yule within one week after the midterm was returned if you want a question to be re-graded. If you can not resolve a grading disagreement with the TA, see Mike Bell within two weeks after the midterm was returned for a final determination of the grade. We reserve the right to re-grade the entire exam if we believe re-grading demands are frivolous.

Give us advance notice if you expect to miss an exam. Contact us as soon as possible after a missed exam if advance notice was impossible. If no valid excuse is provided, a grade of zero will be assigned for the missed exam. (This is a disaster for your grade!) If a valid excuse is provided, at our discretion, a makeup exam will be scheduled or a score will be assigned by prorating scores from all subsequent exams. If you do not take the final exam and at least one midterm, a grade of F in the course will be assigned. Students who miss the final exam without a valid excuse will be assigned a grade of F in the course.

Paper: One short paper will be due on November 25 at the beginning of class. There will be a daily penalty (including weekends) for late papers.

Upper Division Writing Requirement: Papers from BIO 350 may be submitted by Biology Majors to meet the Upper Division Writing Requirement for the major (see applicable *Undergraduate Bulletin*). Forms and information are available in the Undergraduate Biology Office, G05, Biology Learning Laboratories Building. **You must submit this form properly completed to satisfy this requirement and verify that it has been accepted;** it is not our responsibility.

Course Grade Distribution: The course grade will be computed by adding all exam and paper scores. The average grade in this course should be a middle C (2.4, A = 4.0). However, the grade distribution (including +/-) and average grade in the class will depend on the point distribution. Extra credit is not permitted by University regulations.

Religious Observances: Please inform us immediately if any assignment or examination in this course conflicts with a religious holiday you observe. Provisions will be made to allow you to complete your work and observe the holiday. See us if you miss a lecture for a religious holiday so we can arrange for you to get the information you missed. However, it is your responsibility to obtain this information.

Disabilities: If you have a physical, psychological, medical, or learning disability that may impact your coursework, please contact Disability Support Services, ECC (Educational Communications Center) Building, room 128 (631-632-6748). They will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential.

Students requiring emergency evacuation are encouraged to discuss their needs with their professors and Disability Support Services. For procedures and information, see the University web site.

Internet Access: You can access class information on-line at: <http://blackboard.sunysb.edu> If you used Blackboard during the 2003-2004 Academic Year and/or Summer 2004, your login information (Username and Password) has not changed. If you have never used Stony Brook's Blackboard system, your initial password is your SOLAR ID# and your username is the same as your Stony Brook (sparky) username, which is generally your first initial and the first 7 letters of your last name.

For help or more information see: <http://www.sinc.sunysb.edu/helpdesk/docs/blackboard/bbstudent.php> For problems logging in, go to the helpdesk in the Main Library SINC Site or the Union SINC Site. You can also call: 631-632-9602 or e-mail: helpme@ic.sunysb.edu

Academic Dishonesty: Any effort to circumvent the evaluation processes of this course to improve any student's grade is academic dishonesty. Such efforts include, but are not limited to, unauthorized examination of written materials (e.g., neighbors' papers, notes on one's hand) during examinations, plagiarism (see below), misrepresentation of the cause of an absence from an examination, and theft of University Library materials.

Students who commit academic dishonesty gain an unfair advantage in the course and may impose inappropriate costs on the University. Please report academic dishonesty to us. If you request it, your anonymity will be protected. If we believe academic dishonesty has occurred, we will submit an accusation with supporting evidence to the Academic Judiciary Committee of the College of Arts and Sciences with a recommendation of an **F in the course** (see *Undergraduate Bulletin*). Accused students will be informed of the accusation after the report has been submitted. There are no mitigating circumstances for academic dishonesty. Academic dishonesty amounts to **theft of a higher grade at the expense of other students**.

Plagiarism is misrepresentation of another person's writing as one's own. **You are responsible for understanding what plagiarism is**; see us if you do not understand what constitutes plagiarism. Plagiarism includes photocopying or changing the name on a paper written by another person. It also includes incorporation from published or unpublished sources one or more sentences, whether they are intact or slightly modified, whether they are consecutive or scattered among sentences you have written yourself. It even includes incorporating fragments of sentences written by other authors into your own sentences. Plagiarism is prohibited because you are expected to learn the topic and discuss it in your own words. (A paper consisting of long passages in quotation marks with literature citations is not plagiarism, but it does not show that you understand the topic and will be graded accordingly.) If we believe plagiarism has occurred, it will be treated as any other case of academic dishonesty (see above).

Group Study and Peer Criticism: While we try to discourage academic dishonesty, we encourage students to work together to prepare for examinations and to criticize (but not rewrite) other students' papers. If you prepare for an exam with another student, do not sit near her/him during the exam. Students who study together sometimes learn and repeat on their exams errors that appear to result from cheating. Innocence is easily to verify if students with similar errors of this kind sat far apart during the test.

Lectures: Sometimes we mis-speak, we are sometimes unclear, and sometimes we present information that is simply too difficult or condensed or assumes that you know something you have never been taught. Sometimes, we are just plain wrong. Do not hesitate to ask for immediate clarification during the lecture. Such questions both ensure that unclear points are clarified for the whole class and provide us with feedback on the clarity of our lectures. (If Mike Bell is impatient with your question, please tell him to stop being crabby!)

Letters of Reference: It is difficult in a lecture course to get to know students well enough to write an informative letter of reference. Thus, we do not anticipate writing many letters of reference for students in this course. However, if you feel that we have had a chance to get to know you (or you are desperate and want a relatively uninformed letter), please speak to us well before the end of the course about writing the letter.