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SCN 100N.01: Issues in Biology

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Issues in Biology

SCN 100N

SYLLABUS: SPRING SEMESTER 2015

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1) Required materials

- Belk and Borden Maier. 2010. *Biology: Science for Life 4th ed.*

2) Course description

Issues in Biology explores introductory biology by examining core principles in the context of common, everyday issues. This course has been designed to promote understanding of core principles of biology for both general education and as a foundation for future health care professionals. We will examine the biology of issues such as cancer, population growth, human impacts on biodiversity, genetic engineering, and evolution.

3) Objectives

- Understand and apply the scientific method of investigation
- Use critical thinking to evaluate scientific arguments related to issues in biology
- Understand fundamental biological concepts, laws, and theories
- Understand matter, energy, and organization in biological systems
- Identify patterns of interaction in living systems at different scales
- Understand the fundamental concepts of genetics and apply them in current issues
- Examine scientific literature and think critically about biology

3) Recommendations and Expectations

Readings: You must read materials *before* the class for which they're assigned and be ready to discuss them in class for face-to-face students (F2F) or in the respective discussion forum for online (WWW) students.

★ **Strict deadlines for writing assignments** (Your Thoughts, Biology in the News, and Journal Summaries): You must finish writing assignments **on the due date**. I will *not* accept papers after that date **unless you had a legitimate emergency AND told me about it before the due date has passed**. Most assignments are turned in via Moodle; emailing assignments is unnecessary. Read: **DO NOT EMAIL YOUR ASSIGNMENTS**. Post all assignments to Moodle.

4) Exams

Your exams include two parts: 1) online multiple choice and short answer exam located on Moodle and 2) essay exam covering case studies examined in class. Part 1 is open book. Part 2 is not. Although the Moodle tests are open book, you should be very familiar with the material covered in the textbook and be able to apply the concepts learned in Issues in Biology to case studies and real-world examples. The essay section of the exam will be delivered during lecture on the Monday following the online portion of the exam, which closes on Friday.

5) Conduct

- a) **From the vice president for student affairs:** “All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or disciplinary sanction by the University. All students need to be familiar with the Student Conduct Code. The Code is available for review online at http://life.umt.edu/vpsa/student_conduct.php.”
- b) **All work you turn in must be *your own*.** UM's Student Conduct Code forbids:
 - ❖ “representing someone else's words, ideas, data, or materials as your own (plagiarism)”;
 - ❖ “knowingly submitting false, altered, or invented information, data, quotations, citations, or documentation”;
 - ❖ “knowingly helping or trying to help another student commit academic dishonesty”; and

6) **For students with disabilities:** Students with disabilities may request reasonable modifications by contacting me or Disability Services for Students (DSS). The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and DSS. “Reasonable” means the University permits no fundamental alterations of academic standards or retroactive modifications. For more information, please consult <http://www.umt.edu/disability>.

7) **Grading:** Your grade for the semester will be based *largely* on this point system:

Exams (5) – lowest score will be dropped	400
Biological Science Journal Summaries (5)	75
Biology in the News Summaries (5)	50
“Your Thoughts” Responses (10)	50
Powerpoint Presentation of Journal Article	25
Case Study Dissemination	100
<u>Attendance (F2F students only)</u>	<u>100</u>
Total Points for F2F	800 points
Total Points for WWW	700 points

8) **Assignments:** You will have three kinds of assignments to complete (see deadlines in the class schedule):

- a) Ten (10) “Your Thoughts” assignments
- b) A total of five (5) Biology in the News Responses
- c) A total of five (5) Biology Journal Article Summaries

Some suggestions for written assignments:

- Make sure to include your name and which assignment you are submitting
- Proofread your work to eliminate errors
- Do your own work
- Reflect in your own words on what you have learned
- Include a copy of the original article (or a link to the article)

a) “Your Thoughts” assignments:

The purpose of these quick assignments is to have you articulate your perspective on current issues in biology. These will help me better understand the extent of your knowledge and your ideas about the topics we discuss. You will have 10 of these over the semester. These assignments will be posted on the discussion board in Moodle and are based on the concepts discussed in the textbook and supplementary readings. Shoot for a simple short paragraph of 2-3 sentences; tell me what you think!

b) Biology in the News Responses:

Between 3/4 page to one full page, typed and double spaced is a reasonable goal. To complete these assignments:

- 1) Select a current (within the past month) news piece that addresses a topic in Biology. Newspapers such as the Missoulian are acceptable. You may also use newsmagazines, online news sources (other than blogs), PBS.org, or transcripts from radio news programs.

2) Compose a short response to the article. Some things to consider including:

- a) What is the main point?
- b) How does the article relate to biology?
- c) How well did the author/reporter represent the biological issue in the article?
- d) Do any misconceptions exist about biology or science that you can identify?
- e) What did you learn about science or biology from the article?

For full credit, please include a copy of or link to the original article you responded to.

c) Biology Journal Article Summaries:

Again, shoot for a length of about 3/4 of a page to one page, typed and double spaced. The publications you summarize must be peer reviewed articles concerning a topic in the field of Biology. As you search for articles through the Mansfield Library website, you can request only those journals that are "peer reviewed". If you still have any questions about finding peer reviewed articles, I have more suggestions in the Moodle supplement to our course, and you can always email me or ask the librarian. Some of these journals require a subscription for access, and UM subscribes to over 9000 journals. To access this, however, you must go through the university library system. Check with the COT or Mansfield librarian.

Here are a few examples of publications that may be used to complete your summaries:

- Science News* (www.sciencenews.org)
- The Journal of the American Medical Association (JAMA)*
- Scientific American* (www.sciam.com)
- PLoS (Public Library of Science: lots of good articles) <http://www.plos.org/Nature>

The most important considerations when writing your summary are to summarize the methods, findings, and interpretation of the article you read. Including some personal reflection is also a great idea. Was the article fun or challenging to read? Do you think the research is important? But make sure to focus on the methods, findings, and meaning of what you read.

For full credit, your summary must include:

- a) a copy of (or link to) the article you read
- b) a citation for the article.

Here is a model and example for citations in APA format:

Author's last name, Initials. (Year published). Article Title. *Journal Title*, Volume number, pages.

Newman, J. L., Fuqua, D. R., Gray, E. A., & Simpson, D. B. (2006). Gender differences in the relationship of anger and depression in a clinical sample. *Journal of Counseling & Development, 84*, 157-161.

SAMPLE JOURNAL ARTICLE SUMMARY:

Susie Student
Journal Article Summary #4

SCN 100N Fall 2009
Nov. 14

The power of positive thinking

I found the article about whiplash recovery interesting because it explores how the mind can affect the body, which we have recently been discussing in class. I believe a positive outlook can do a lot to give us a happier life.

The researchers in this article explored the possible relationship between a person's expectations for a recovery from whiplash and the actual recovery from whiplash (whiplash is described as the sudden hyperextension or "whipping" of the neck). The researchers found participants from two Swedish traffic insurers between January 15, 2004 and January 12, 2005. The sample included people between 17 and 74 years of age who had reported a whiplash injury. These subjects were not hospitalized for more than two days and there were no fatal injuries to any of the passengers in the car.

Questionnaires were sent out to the subjects shortly after the accident, and then again six months later. They contained questions about the accident, about pain and other symptoms, preexisting conditions, and the person's expectations for recovery. The data concluded that those who stated that they were less likely to make a full recovery were 4.2 times more likely to have a high disability than those who stated that they were very likely to recover.

The findings call for more research, but the data suggest that a person's expectations for recovery make a big difference. So it comes back to the idea that if you have a good outlook on life, life may actually be better. It is definitely something to think about the next time you or someone you know gets hurt.

Citation: Holm LW, Carroll LJ, Cassidy JD, Skillgate E, Ahlbom A (2008) *Expectations for Recovery Important in the Prognosis of Whiplash Injuries*. PLoS Medicine Vol. 5, No. 5, e105
doi:10.1371/journal.pmed.0050105

*** For full credit, the submission of this summary would include a copy of the original article.

Spring 2015 Schedule

<u>Date:</u>	<u>Topic:</u>	<u>Due**:</u>	<u>Read Ch. (pp):</u>	<u>Case Studies:</u>
Week 1	Biology as Science	Your Thoughts 1	1 (1-16, 21-25)	
01/26 - 01/31	Basic Chemistry, properties of water	News #1	2 (31-35)	Salem's Secrets
Week 2	Cell types, cell structure	Journal #1	2 (35-52)	A Can of Bull - Do energy drinks really provide a source of energy?
02/01 - 02/07	Nutrition, cell transport	Your Thoughts 2	3 (54-69)	
Week 3	Energy in living systems: respiration	News #2	4 (73-88)	Cellular Respiration
02/09 - 02/14	Energy in life: photosynthesis	Your Thoughts 3	5 (95-107)	
Week 4	EXAM 1*		Moodle	
02/16 - 02-21	Cancer	Your Thoughts 4	6 (111-142)	Human Cloning Debate
	Genetics	Journal #2	7 (147-167), 8 (175-8)	
Week 5	Gene expression	Your Thoughts 5	9 (195-207)	FILM: Harvest of Fear
02/23 - 02/28	Genetic engineering	News #3	9 (209-217)	GMOs debate
Week 6	Evolution	Your Thoughts 6	10 (221-246)	FILM: Evolution on Trial
03/02/ - 03/07	Natural selection; disease	Journal #3	11 (251-270)	ID vs. Evolution Debate
Week 7	EXAM 2*		Moodle	
03/09 - 03/14	Biodiversity	Journal #4	12(276-287), (290-301)	Sneaky Salmon
	Classification of life	Your Thoughts 7	13 (307-334)	FILM: Lord of the Ants
Week 8	Classification of life	News #4		Bioprospecting
03/16 - 03/21				
Week 9	EXAM 3*		Moodle	
03/23 - 03/28	Human population	Your Thoughts 8	14 (339-352)	FILM: Blue Gold-World Water Wars
Week 10	SPRING BREAK - NO CLASS			
03/30 - 04/04				
Week 11	Ecology: human impacts	News #5	15 (357-365)	The Wealth of Water
04/06 - 04/11	Ecology: interactions	Your Thoughts 9	15 (366-85)	

<u>Date:</u>	<u>Topic:</u>	<u>Due**:</u>	<u>Read Ch. (pp):</u>	<u>Case Studies:</u>
	ORAL PRESENTATIONS on Thursday/Friday			
Week 12	Ecology: interactions			Prairie Garden of Troubles
04/13 - 04/18				
Week 13	Ecology: interactions	Journal #5	15 (365-385)	FILM: The Story of Stuff
04/20 - 04/25	Ecology: interactions			
	ORAL PRESENTATIONS on Thursday/Friday			
Week 14	Ecosystem Biomes		16 (389-414)	Ecofootprint
04/27 - 05/02	Ecosystems: humans and resources			
Week 15	Humans and Wildlife	Your Thoughts 10		Killing Coyote
05/04 - 05/09	EXAM 4*		Moodle	
	ORAL PRESENTATIONS on Thursday/Friday			
FINAL WEEK	FINAL EXAM***		Moodle	
05/11 - 05/15				

* All exams open in Moodle on Monday at 9 AM of the week they were assigned and close on Friday at midnight (12 AM Saturday) of the same week.

** All assignments are due by Friday at midnight (12 AM Saturday) of the week they were assigned.

***Final Exam is due on Wednesday of Finals Week.