

**SYLLABUS – NEM 010V – GENERAL BIOLOGY
SPRING QUARTER 2016**

This is the final version of the Syllabus completed on March 27, 2016. Any changes to the course that may be required will be dealt with in Announcements in Course Content. After reading this Syllabus, I invite you to take a short quiz to be sure you understand what you have read. Don't worry, all of the questions are within the Syllabus, and you can take the quiz as often as you want until 5:00 pm Wednesday April 13, until you get all the questions correct. The quiz will be worth 10 points towards your final grade. The quiz is linked to the smartsite.ucdavis.edu home page for the course. Click on Tests and Quizzes in the left hand column of the page.

Web Information: For this course, you must have ready access to the Internet, a current web browser, e-mail, and be reasonably proficient with these electronic tools. You will also need a word processor program such as MS Word. Arranging for computer and web access is your responsibility. There are a number of computer labs on campus that can be used.

Advertising: Many of the web sites we will be visiting will contain annoying advertisements. I will never ask you to buy anything offered for sale on the web. Try to develop your concentration skills to the point where you can ignore these ads altogether. If you should have to watch an ad prior to being able to watch a video, keep in mind that you are saving at least \$150 by not having to buy a textbook for the course. You can watch a few ads and still be ahead of the game there.

Getting Lost on the web: My goal is to not have you get lost and be wandering around the web. I have been teaching this course online since 2002, so I hope we have worked out most of the bugs. You need to help me out by letting me know if you are getting lost and if my instructions are not clear.

Web sites with audio: Most of the web sites we visit will have audio as well as video content. If you don't already own a set, you should consider buying a small, inexpensive set of earphones to use for the course. If you are using a computer with speakers, keep this in mind if others are in the room trying to concentrate on something else. If you are in a computer lab, you will not be able to hear the audio unless you plug into an earphone jack located on or near the computer.

Email: I or your TA will use a class email list as needed to send you important information. You will be responsible for any communications sent to you via UC Davis email and should check your UC Davis email several times a week. Please read the Syllabus before asking questions about the mechanics of the course. If you do not already have one, you should get a UC Davis email account. You can do this at IT-Express in the Shields Library.

smartsite.ucdavis.edu

For the course, we will be using some of the features of smartsite.ucdavis.edu. To login to smartsite.ucdavis.edu, open your web browser. Type <http://smartsite.ucdavis.edu> in the url address line that should be visible at the top of the browser page.

Once at the smartsite.ucdavis.edu page, click on the link in the upper right hand portion of the page that says "Login". You will be prompted to enter your user name and password (the same ones you use to access other password protected UC Davis sites). Do this and you will be taken to your homepage for smartsite.ucdavis.edu.

Click on the link to NEM 010V General Biology. This will take you to the homepage for your section of the course.

Along the left edge of the page you will see links for:

- COURSE CONTENT
- WHAT'S GOING ON HERE?
- ALTERNATE CONTENT
- Gradebook2
- Tests & Quizzes
- Assignments
- Forums

Clicking on these links will route you to the various elements of the course.

COURSE CONTENT: will open the Course Content. When you look at the Course Content, you will see that the course pages follow a similar format. There is a Menu bar at the top of each page showing that the course is divided into seven Units: Biosphere, Cells, Early Life, Invertebrates, Vertebrates, Humans, and Plants. Clicking on the name of a Unit produces a drop down menu of several Sections. Clicking on a Section will bring you to a page on that topic. Note that under Biosphere you will find links to the Syllabus and the Course Calendar. Above the Section title is a link to Announcements for the course that will be updated periodically. There is also a link to an Alternate Menu. A difficult problem facing web designers is how to make websites function the same with the many different browsers and devices available; and menu bars seem to be particularly problematic. On a small screen you will only see the word MENU to the left and to the right a gold icon with three blue bars. Clicking on this icon will open the MENU. If you do not see the Menu bar on a page, click on the link to Alternate Menu, and it will take you to a conventional menu with the same links as the Menu bar. Moving down the page, you will find a link to: Introduction to this section. Here I have recorded a very short verbal explanation as to why I selected the Videos and Reading for the Section. Next you will find the assigned readings consisting mainly of links to current news articles or articles from the NobelPrize.org website. Then you will find several YouTube videos to watch followed by the Summary/Study Guide that I will prepare for each Section and that will help you to study for the exams. In many cases, you will find that I have

extracted exact wording from the videos and readings rather than paraphrasing. This is because I plan to use the same wording when I develop multiple choice exam questions. Finally, there is a Source list with urls that you can use to access the original sources directly if you wish.

I have set up the Sections so that the videos are embedded, and will play within the web page when you click on them. Note that once you click on a video, a menu bar appears at the bottom of the frame. This will give you various options depending on the video. Possibilities include moving forwards and backwards, muting, closed captions, watching on YouTube, and watching full screen. Some of the Sections include figures and/or tables. Click on these if you want them to open in a larger view in a separate tab.

When you watch some of the videos, they will refer to a previous video or a following video in a series. Ignore these references because in most cases you will not have seen the previous video or be asked to watch the following video of the same series. These are conscious decisions I have made in choosing what I think are the best videos in particular areas of biology.

WHAT'S GOING ON HERE? is just a brief overview of the course for those wondering what this online course is all about.

ALTERNATE CONTENT: is a link to a commercial server on which I have put a backup copy of the Course Content in case the SmartSite server should be down for some reason. Please use the SmartSite location whenever possible, because I have to pay for the alternate site.

It's important for you to understand that smartsite.ucdavis.edu does not work reliably with all browsers. If you are going out of town and will be using a computer you are not familiar with, you may have problems using smartsite.ucdavis.edu if the computer does not have a compatible browser on it. You may also have problems if the computer has different security settings and software than the one you normally use (e.g. software to block pop-ups and cookies). Plan ahead so you do not have problems taking midterms, doing your postings, and submitting your essays. Take your TA's email address with you so you can let them know if you are having a problem.

If you are only going to be looking at the Course Content, you do not need to start with smartsite.ucdavis.edu and will not need to enter a username and password to access it. I recommend that you bookmark both Course Content sites if you will primarily be using one computer during the course. As an alternative, you can print out a copy of this page so you will have them available if needed.

Here are the two Course Content links:

SmartSite:

<https://smartsite.ucdavis.edu/access/content/user/00002950/courses/sites/16calendar>

.html

Alternate Site: <http://www231.pair.com/fzwester/courses/sites/16calendar.html>

Gradebook2: This is where your TA and I will enter your points for the Introductory Quiz, Papers, Virtual Office practice posting, Midterms, and Final. At the start of the course, you should be able to see all of these categories in the gradebook. At times, while we are grading various categories, some of the categories may disappear, so that we may enter grades and release them all at once. Don't worry, they will return. Just so there is no confusion, I do not get to name the gradebook. Gradebook2 is the name chosen by the developers of smartsite.

Your grade will be based on 1,000 total points composed of 5 elements:

- (1) Quiz on course mechanics (take by 5:00pm on April 13) = 10 points
 - (2) Term Essays / GE Writing Experience
 - Essay 1 (due March 31 by 11:59pm) = 35 points
 - Essay 2 (due April 7 by 11:59pm) = 35 points
 - Essay 3 (due April 14 by 11:59pm) = 35 points
 - Essay 4 (due April 21 by 11:59pm) = 35 points
 - Essay 5 (due April 28 by 11:59pm) = 35 points
 - Essay 6 (due May 5 by 11:59pm) = 35 points
 - Essay 7 (due May 12 by 11:59pm) = 35 points
 - Essay 8 (due May 19 by 11:59pm) = 90 points
 - Essay 9 (due June 2 by 11:59pm) = 90 points
 - (3) Virtual Office practice posting (due April 13 by 5:00pm) = 15 points
 - (4) Midterm Exams = 300 points total
 - Midterm 1 (online April 22) = 100
 - Midterm 2 (online May 13) = 100
 - Midterm 3 (in class on day of final exam) = 100
 - (5) Comprehensive Final Exam = 250 points
- Total: 1,000 points

Letter grades will not be given to any individual assignments, exams, or portions of the course. Your grade will be based only on the total number of points you have accumulated at the end of the course. What this means is that you cannot argue that if you receive what you feel are "A's" on some portions of the course and "F's" in others, your grade should be an average of what you feel those letter grades are. Because your grade is based only on the total number of points you receive, you need to participate and do well in all parts of the course in order to receive a good grade.

Unfortunately, the Smartsite gradebook does not "roundup" the way many of us have been taught to expect. Each year, some students are disappointed to find themselves 0.5 points away from the next highest grade. I am sorry if this happens to you. I have complained about this to the Smartsite developers but they do not seem to be inclined to do anything about it.

If you have a situation that requires special exam conditions, let me know and we will make the needed arrangements.

Tests and Quizzes: Here you will find a link to the Introductory Quiz that you should take after reading the Syllabus. You will be given the questions and answers for the quiz in the Syllabus. The quiz is just to be sure you have read and understood the mechanics of the course. You can take the quiz as many times as you want until 5:00pm on Wednesday April 13, until you get a perfect score. You will then receive 10 points towards your final grade.

I suggest taking the quiz as soon as you can. If you ask questions on course mechanics that are answered in the Syllabus, before you take the quiz, your TA or I may ask you to re-read the Syllabus and take the quiz before we answer your questions.

This is also where you will find the links to take Midterm 1 and Midterm 2 online.

Midterms

There will be 3 midterms during the course. The first 2 midterms will be online and the third will be in class at the time of the final exam. The online midterms will be open for 24 hours and you can take them at any time during that period, but only one time. All midterms will be multiple-choice exams with 25 questions (4 points per question). The questions for exams will be drawn randomly from a “question bank” and could be different for each person taking the exam. For the online midterms you will have 30 minutes to work on the exam. You may use the course website (Readings, Videos, and Summary/Study Guide) if necessary. However you will not have a great deal of time, so it is best to thoroughly study the information beforehand. The third midterm and the final exam will be in class and you will not have access to reference materials. The final exam will be easier for you if you don't wait to the end to cram for it.

I have tried to write the Summary/Study Guide so that its statements can be directly converted into test questions. For each midterm, at least 70% of the questions will come from the Summary/Study Guide for each section of the course. The remaining questions will be similar to and from the videos, readings, figures and tables. The “authority” for correct answers on all exams will be the assigned videos, figures, tables, readings, and Summary/Study Guide; as opposed to something you may have read or heard elsewhere or learned previously.

When you take a midterm, it is always possible that the smartsite server may malfunction and there will be no one to “fix-it” right away. If this happens to you please try to make a screen shot of the error message that you get and to email me immediately. We will handle any problems on a case-by-case basis.

If you are not able to take the online midterms at the scheduled times, let me know so

that a time can be arranged for you to take a closed source written exam.

Your scores for the online midterms will be released in Gradebook2 of smartsite.ucdavis.edu, after the 24-hour exam period is over. For the third midterm, after the exams are graded, the questions, the answers, and your answers will be posted on the class website under the last 4 digits of your student id. Contact me if you want your actual exam or scantron returned to you. You can also view your grade by clicking on the Gradebook2 link of smartsite.ucdavis.edu.

Final Exam

The final exam for the course will be a multiple-choice scantron exam. It will be comprehensive covering the information on the 3-midterm exams. The final exam will be worth 250 points. It will consist of a total of 50 questions worth 5 points each ($50 * 5 = 250$ points).

You should bring a pencil and 2 blue UCD 2000 scantron forms (one each for midterm 3 and for the final exam) to the final exam period. You must also bring a picture id. We will check your ID when you turn in your exams. This is a TBA class, so the final exam is scheduled to be held on Thursday, June 9, 2016 from 8:30 pm until 10:30 pm. The room will not be assigned until about the seventh week of the course.

After the exams are graded, the questions, the answers, and your answers will be posted on the web under the last 4 digits of your student id. Contact me if you want your actual exam or scantron returned to you. You can also see your grade by clicking on the Gradebook2 tab of smartsite.ucdavis.edu.

QUIZ QUESTION: Which of the following is true about when the class meets and timing of exams?

- a. This is a web based class that only meets during the final exam period.
- b. The course will have 2 online (April 22 and May 13) and 1 scantron midterm.
- c. The third midterm and the final exam will be taken during the final exam time June 9 from 8:30-10:30 pm.
- d. All of the other answers are correct.

Assignments: Here you will find links you will need to use to submit components of the GE Writing requirement. Your TA will be providing you with additional information on the GE Writing portion of the course. This course has a GE Writing Experience component that requires 10 pages of writing with feedback provided on a portion of the writing. We will be dividing this into multiple short writing exercises.

The entire GE Writing Experience will be worth 425 of the 1,000 points in the course, so you should be prepared to work hard on the assignments. We are fortunate that our TAs have previous experience TAing GE Writing Experience courses. Your TA will provide you with details on the writing assignment.

Essays submitted late are subject to -30% deduction per day late, beginning immediately after the due date and time, including weekends and holidays. If you have a legitimate excuse for not submitting a paper on time, email your TA before it is due. If you do submit a paper late, it is your responsibility to email your TA that you have submitted it. If your TA does not know you have submitted your paper, it will not be graded.

Note that your essays are due at 11:59 pm each Thursday during the course except for one. It is always possible that the smartsite server may malfunction and there will be no one to "fix-it" until the next day. If this happens to you, follow these steps: (1) Save a copy of the last screen you are able to access or the screen that gives you an error message. (2) Do not resave your essay after 11:59 pm so that your TA will know that you finished the essay on time. (3) Immediately email a copy of the screenshot and your essay to your TA, so they will know you finished the essay on time.

To submit Essays, logon to the smartsite.ucdavis.edu page for the course. Click on the link in the left hand column that says "Assignments". On the new screen that opens up, under the words "Assignment Title", click on paper you are submitting. When the next screen opens, click on "Add Attachments". When the next screen opens, click on "Choose File". Find and select your file on your computer and click on "Choose". Wait for your file to upload and appear in the list "Items to attach". Then, click on "Continue". On the next screen that opens, click on "Submit". The next screen will say "Submission Confirmation" and you will be sent an email indicating successful submission. Print or save a copy of the Submission Confirmation screen and the confirmation email you receive.

It is your responsibility to double check the Assignments area of smartsite.ucdavis.edu to be sure that your Essays are submitted properly. If you can't get a paper to submit from your home computer, go to one of the campus computer labs and try to do it from there. If you are having trouble with the procedure, it is best to first ask one of the campus computer lab monitors to help you. Then, if you are still having a problem, let your TA know. If you cannot get your paper submitted through smartsite.ucdavis.edu, email the paper to your TA.

All TAs will be using the same criteria for grading. To assure that this is the case, all TAs will grade several of the same papers and agree on the grading criteria. The grades for all sections will be released at the same time. This is because in the past some students have felt students receiving grades prior to others had an advantage on the final exam over those who did not.

QUIZ QUESTION: Which of the following is true about the GE Writing requirement?

- a. During the quarter you will be submitting several short essays.**
- b. Essays will be due each Thursday of the course except one at 11:59pm.**

- c. You will submit your Essays as attachments under the Assignments feature of SmartSite.
- d. If submitting the attachment doesn't work when you try it in Assignments, you will email your paper to your TA.
- e. Papers submitted late are subject to -30% deduction per day late, beginning immediately after the due date and time, including weekends and holidays.
- f. All of the other answers are correct.

Forums: This is the link to your Virtual Office where you can ask questions about the course, find answers to questions that others have asked, and where your TA will share important information with you. During the first 3 weeks of the course (March 28 - April 13), you must post a single practice posting to demonstrate that you understand the procedure for asking questions.

The Forums link in SmartSite will serve as a Virtual Office for the course. If you have general questions about the class or any of the assignments, the Virtual Office is the place to ask them. If you have personal questions or private matters to discuss with the TAs or the instructor, email is more appropriate. The Virtual Office is also a location where your TA will share important information with you. You are responsible for checking the Virtual Office at least every other day (e.g. Monday, Wednesday, Friday) during the course for new information that may have been posted.

To access the Virtual Office, click on the link to Forums in the left hand column of the SmartSite homepage for the course (smartsite.ucdavis.edu). During the first three weeks of class, you must do a single practice posting to demonstrate that you understand how to access the Virtual Office and to ask questions. To get credit for your practice posting, you must post this sentence: "This is my practice posting." This posting will be worth 15 points towards your grade. This practice posting must be done by 5:00pm on Wednesday April 13.

You should use complete sentences for your postings. Do not use texting abbreviations. It is your responsibility to check the Virtual Office to be sure that your practice posting has been received. If you can't find your posting, neither can your TA, and you will not receive credit for it.

In Forums there is also a place for Open Discussion. You are not required to post anything, but if you have something you think would be of interest to the class, you can share it here. Suggestions would be if you recognize there is a fallacy in a video, or a faulty correlation, it would be interesting to share this. Comments on the way you think a video might be trying to influence your opinion via background music, narrator's tone of voice, or choice of visuals would also be interesting. I put considerable effort into picking videos for the course, but if you find one you think is better on a topic, please share it with the class.

After providing background in an area, some of the Sections proceed to discussions of policies on which there are a variety of opinions, such as the creation of life, evolution, acid rain, climate change, biodiversity, and population growth. These are possible topics for Open Discussion. Frame your views in a way that presents factual, rather than emotional information, and do so in a way that does not denigrate the views of others.

Confine your postings to information relevant to the class. Inappropriate postings will be removed by your TA and 10 points will be deducted from your grade for each inappropriate posting.

QUIZ QUESTION: Which of the following is true about the Virtual Office?

- a. The Forums feature of SmartSite will function as a Virtual Office for questions concerning the course.**
- b. You are responsible for checking the Virtual Office at least every other day (e.g. Monday, Wednesday, Friday) during the course for new information that may have been posted.**
- c. During the first three weeks of class, you must do a single practice posting to demonstrate that you understand how to access the Virtual Office and to ask questions.**
- d. Your practice posting must be done by 5:00pm on Wednesday April 13.**
- e. It is your responsibility to check the Virtual Office to be sure that your posting has been received.**
- f. All of the other answers are correct.**

Reading / Textbook

There is no textbook for the course. There are a number of required readings and you will find links to these close to the top of each Section of the course website. They are listed under the heading "Reading". Most of the readings are short and are links to current news articles related to the subject matter of the section for which they are posted. Many of these are from the BBC news website. I seem to gravitate to this website because I find it has fewer advertisements than other news sites. Other readings are from the NobelPrize.org website. In some cases, these are press releases and in other cases they are lectures delivered by Nobel Prize Laureates. I have selected these because they provide good explanations of the topics covered and/or provide insight into the way science is done. There will be questions on the midterms and on the final exam from major points covered in these readings.

If you feel that you need to have a textbook, I would look online for any recent editions of C. Starr, C. A. Evers, and L. Starr, "Biology Today and Tomorrow With Physiology".

There are also options to access free biology books online:

This links to a book that is entirely online.

<http://www2.estrellamountain.edu/faculty/farabee/biobk/biobooktoc.html>

At this link you can download a PDF of the biology book from which I took most of the figures and tables I've used in the course:

<http://www.ck12.org/book/CK-12-Biology-Concepts/>

Office Hours

To give you more flexibility, I will be holding office hours by appointment. I would be happy to meet with you at any time. My office is in room 4202 Storer Hall. My email is bbwesterdahl@ucdavis.edu. Because of my Cooperative Extension appointment, I am frequently away from campus. So, it is best for you to make an appointment to see me, rather than just dropping by. When you do come to see me, be sure to knock. The UCD Fire Department does not allow us to keep our doors open.

I check my email regularly and will try to respond quickly to all of your questions. Please put Nem10V or something similar in the subject line. I get a lot of junk email and may not open your email if I don't realize it concerns the class.

The TA's for the course will also be holding office hours by appointment. The TA's will be monitoring the Forums / Virtual Office frequently, so you might find the answers to your questions there, or you can send them an email.

Will I be grading on a curve?

I will be grading on what I call a modified curve. If I were to grade on a curve, the average grade for the class would be a C and some of you would have to receive D's and F's. My preference would be that none of you receive D's and F's. However, if your scores are much lower than the rest of the class, you will leave me no choice. I would also like to think that I am a good enough teacher that most of you will learn enough about biology to receive a grade higher than a C.

Extra Credit

There will be no extra credit. I have never understood the concept of extra credit. My preference is that you spend any extra time you may have studying the lecture material and writing better essays.

Adding the Course After the First Day of Class

You are welcome to add the course up until the last day to add which is Tuesday April 12. If you add the class late, you will need to take the Introductory Quiz by 5pm on Wednesday April 13. This quiz will cover information in the Syllabus on the mechanics of the course. You can take the quiz as many times as you want until April 13, so you can get a perfect score. It is worth 10 points towards your final grade. You will need to be sure to do a practice Virtual Office posting by 5:00 pm on Wednesday April 13. This is worth 8 points towards your grade. You will take the midterms on the same days as the rest of the class.

QUIZ QUESTION: Which of the following is true about adding after the first day of class?

- a. You are welcome to add up until the last day to add which is Tuesday April 12.
- b. You will need to take the Introductory Quiz on the Syllabus by 5:00 pm on Wednesday April 13.
- c. You will need to arrange with your TA to makeup any Essays that were due before you added the class.
- d. You will take the midterms at the same time as the rest of the class.
- e. You will need to do a practice Virtual Office posting by 5:00 pm on Wednesday April 13.
- f. All of the other answers are correct.

Course Evaluation

UC Davis has an online course evaluation system that you will be able to access at some point towards the end of the quarter.

How much time will the course take?

The UC Davis General Catalog indicates that you should receive 1 unit of credit for three hours of work each week including time spent in lectures and discussions. For this four-unit course, this would be 12 hours per-week.

One thing that is very important for a web-based course is for you to plan several hours each week to work on the course. Do not let yourself get behind. This is a course in which you will need to learn new information via memorization. If you are not used to courses in which memorization is required (sometimes called "content" courses), you should set aside time each week rather than cramming just before an exam. You will also need to use the new information you are learning when you prepare your papers. Each year, some students lose points because they "forget" to turn in their assignments on time. Be sure to put the due dates for assignments on a calendar and be sure to check it regularly.

There is no perfect way to determine how much work/time an online course should take compared to a traditional lecture/discussion course. This is the rationale I used when creating this YouTube version of the course. In a typical 4-unit course, you would be spending 200 minutes a week in class (e.g. 4 class periods of 50 minutes each) and attending 38 lectures/discussions during the quarter for a total of 1,900 minutes in class (50 minutes X 38 lectures = 1,900). Many of the videos deliver information more rapidly than a professor would during an in class lecture. Other videos are great depictions of biology but contain less information. My goal was to limit the total amount of video time to 950 minutes so that you could watch each video twice during "class time". I missed my target by 85 minutes and the course consists of 1,034 minutes of video. Next, rather than dividing the Sections up into lectures, I developed a calendar for each week listing the Sections you should try to cover that week and the total time for videos for that week. You can cover the information at your own pace, as long as you complete the

Sections required prior to each midterm.

Why is this an online course?

This course was originally developed by Dr. Richard Falk who taught BIS 10 Spring Quarter each year by the traditional lecture and discussion method. More than 20 years ago, faculty became aware of the potential for the web to be used for teaching. Some thought it was a great idea and others thought a medium used to advertise cars and soft drinks should be relegated to just that. Dr. Falk gave it a try and gave his student's the option of taking the same class either by traditional methods or by accessing the web. He decided that both groups of students learned a similar amount of biology and convinced the faculty committee on courses to create the web course BIS 10V (with V standing for virtual).

Before actually teaching BIS 10V, Dr. Falk moved on to a position with another University. I asked to be allowed to take over the course and was given permission to do so. Because my appointment is in the Department of Entomology and Nematology, the course became crosslisted as NEM 010V. Recently, BIS 10 was revised and renamed Everyday Biology. NEM 10V was decrosslisted and continues to be taught online as General Biology.

For the past 21 years, I have been actively engaged in a combination of traditional classroom and web based instruction. I have taught a portion of Entomology 156 (Biology of Parasitism) lecture and laboratory, and PPP 201 (Concepts of Plant Protection and Pest Management), and Nematology 204 (Management of Plant Parasitic Nematodes). As is common for many working in the sciences, I have a joint appointment at UC Davis. This includes a partial I&R (Instruction and Research) appointment combined with a CE (Cooperative Extension Specialist) appointment. NEM 10V is part of my I&R role. My CE role takes me on teaching and research adventures throughout the state of California.

Is a web-based course a better way to teach biology than in a traditional classroom?

There is still much discussion and debate about this. Until recently, my own opinion was that if I could be in a classroom with 10 of you at a time, the more traditional methods of teaching biology would be as good, if not better than a web based course. However, in my experience, once a class reaches a certain size, the quality of the student - teacher relationship and of the teaching begins to deteriorate. The maximum class size for each instructor to feel they are still engaging each student in a quality learning process is different for each instructor but most would agree that a class of over 100, such as we have, would be too large to meet these criteria.

Many in the sciences have embraced the web concept of teaching by placing their course material on the web for others to share. If one were to do a web search for a common topic of biology courses, such as biome, one would find numerous sites developed by experts in the field anxious to share their best descriptions, pictures and

animations with us. When I first developed NEM 10V, web pages loaded much more slowly than they do today. The course utilized text-based lectures linked to the best visuals available on the web. Over time, web speeds have increased dramatically, and many excellent short subject videos on biology have become available on YouTube. This past year, I have totally recreated NEM 10V as a YouTube based course supplemented by web based readings and a text based Summary/Study Guide. Given that Biology is the study of life, and that with videos we can observe life in real time, I now feel that a web-based course is a better way to teach biology than in a traditional classroom.

One of my goals in this course is that rather than to delve deeply into biology topics that you would likely never encounter in real life, I would like to help you organize and solidify a background knowledge of biology so that you can use it to understand and evaluate what is happening in the real world. When selecting topics and videos, I continually asked myself whether this was something that people not majoring in science really needed to know. A common misconception about science is that it is conducted and reported in a totally objective manner. Ideally this is the case, but today's scientists are under tremendous pressure to sell themselves and their ideas in order to obtain funds to support their research. To help you understand what biologists do and how they do it, quite a few of the videos and the readings describe ongoing research in a variety of areas. As you watch the videos, be alert to ways their creators may be trying to influence your reaction to the information presented. If there is background music, why was it chosen, and how does it make you feel? Is the announcer's voice authoritative, or perhaps condescending as if speaking to a child? In several of the videos scattered throughout the course, the narrator pitches their voice as if speaking to a child as if that will make a topic easier to understand. Why are some topics presented as animations rather than live media? Can you spot any fallacies in the videos (See Scientific Method Videos 3 and 4)? Does the video correctly or incorrectly use correlation to imply causation (See Scientific Method Video 5)?

How should You study for this course? This is a question I am frequently asked. First, you will need to take more responsibility for your actions in this course than in a traditional lecture course. The information presented and the learning expectations for the exams will be very similar to those in a traditional biology lecture course. Ask yourself what you get from a traditional lecture. Why do you attend (or not attend) lectures and what adjustments will you need to make in your study habits to be able to learn the information presented.

You may find that most of the information presented in this course is already familiar to you. This is because you have very likely taken biology or life science in middle school and high school. The California curriculum requires you to have a year of biology or life science in middle school, and at least an additional year in high school. I understand that for some, your previous exposure to biology has developed into a fear and loathing rather than into an understanding of biology. My hope is that you will find actually seeing biology in YouTube videos rather than listening to it in a lecture format will clarify

and dispel the confusion and fear that you feel.

Taking notes is an activity you likely participate in when you attend a lecture. An expert on the subject is speaking and you are trying to learn what is being presented. Learning takes place when you are actively involved in manipulating the information presented. You are hearing the instructor deliver the lecture, you are watching information being written on the blackboard, and you are actively summarizing the information presented in your notes. If the class is not too large, and you are not too intimidated, you will ask questions if you don't understand. You may want to take notes on the videos, or you may find the Summary/Study Guide in each Section will substitute for this.

In a lecture class, you are also alertly and very keenly trying to read the instructor's mind and determine by mannerisms, voice inflections or direct questioning what is likely to be on the exams. All of this has been happening at least since the days of Aristotle, several hundred years BC. In spite of tremendous changes in technology, with the exception of increasing class sizes, the University learning process has remained relatively unchanged for hundreds of years.

In this course, we are taking a huge leap in a different direction. We are attempting to substitute for, and perhaps even improve on, the traditional learning process. What has changed that could allow us to do this? For one thing, technology has changed. The web has created an environment where we can travel anywhere in the world via our computer screens.

Perhaps most importantly, students have changed and their expectations have changed from those of previous generations. Many of you are "digital natives". You are part of a generation that likely played video games before you could walk or talk. You grew up with Sesame Street, Barney, Carmen San Diego, and other educational television programs teaching you the basics of language, math and science before you even went to school.

How do you learn your way through video games? How did Big Bird teach you to read? I don't actually know. Practice, repetition, memorization, and synthesis of ideas are all involved in learning. In both video games and classroom lectures, your senses and your concentration are engaged, and you manipulate the information presented. You do this differently perhaps, but hopefully just as effectively, as when you are sitting in a classroom lecture. And which have you found to be more enjoyable?

But, how will you know what is going to be on the exams? Well, we don't actually have video games, but I have prepared a Summary/Study Guide for each Section of the course. I have tried to write the Summary/Study Guide so that its statements can be directly converted into test questions. For each midterm, at least 70% of the questions will come from the Summary/Study Guide for each Section of the course. The remaining questions will be similar to and from the same source materials. I do not believe in

writing trick or trivial questions. When I write each question, I will be asking myself if it reflects information that is useful for you to know.

Please use each Section's Summary/Study Guide to review the information presented in the Videos and Reading, not as a substitute for them. Remember that you will only get out of this course what you put into it. If you choose to just memorize the Summary/Study Guide without watching the Videos and doing the Reading, it is likely that you will end up feeling like you have not learned much of anything, and that will be true.