

## BIOL 4900A – SENIOR SEMINAR, Spring 2015

CRN 21331; M 5:00 – 6:50 p.m. in BC 1025, R 4:00 – 4:50 p.m.; Science Seminar required; usually in Powell Hall

### Instructor: Dr. Russell H. Goddard

BC 2090: 249-2642

Office Hours: MTW 4:00 – 4:50 p.m. or by appointment.

email: [rgoddard@valdosta.edu](mailto:rgoddard@valdosta.edu)

Note: All official correspondence must be sent to the above VSU email address. Dr. Goddard does not use BlazeView Email and any email sent to that location will not be read so don't waste your time!

**Course Description.** Pre- or Co-requisite: Completion of all required courses in the senior curriculum for the biology major. Graded "Satisfactory" or "Unsatisfactory." The capstone course in biology. Students are required to attend outside lectures chosen by the instructor. This course assesses students' ability to research independently topics in biology, assimilate the information, and disseminate the information in an organized and understandable fashion in both written and oral forms. Besides demonstrating comprehension of their topic and competence in communication skills, students take the ETS Major Field test in biology and complete the departmental Senior Exit Questionnaire for successful course completion. [0-3-1]

### Course objectives:

- To assess students ability to independently research topics in biology, assimilate the information, and then to disseminate the information in an organized and understandable fashion in both written and oral forms.
- To administer and evaluate students' satisfactory completion of the ETS Major Field Test in biology and completion of the departmental Senior Exit Questionnaire

### Course Outcomes. This course meets the following educational outcomes.

VSU General Education Outcomes 4, 7

Biology Educational Outcome 1

### Specific Course Requirements:

Choice of topic: **Due by 20 January 2015**

General Outline with early references for term paper (**due by 3 p.m. Friday, 23 January**)

Term Paper (**Due Friday 6 March 2015**) all term papers are due on this date regardless of when your oral presentation is scheduled

Oral Presentation (20 min talk): TBA

Completion of the Major Fields Test in Biology with a score of 140 or higher.

Completion of the Senior Exit Questionnaire

Attendance at all scheduled class meetings (More than two absences will result in an *Unsatisfactory* grade)

Attendance of and submission of completed evaluation forms for all science seminars.

*Failure to successfully complete any one of the above assignments will result in an Unsatisfactory course grade.*

**Major Field Test.** The ETS Major Field Test is a comprehensive, standardized test designed to evaluate the student's general knowledge in the sub-disciplines of biology. The test scores will be used to evaluate the effectiveness of the department's curriculum, and VSU's scores will be compared to the national average to identify possible weak areas in our curriculum. Thus, students should take the test seriously and make every effort to excel on it. *Completion of the ETS Major Field Test with a score of 140 or higher is a course requirement, and students who fail to complete the ETS Major Field Test will receive a grade of unsatisfactory for the course.*

*Each individual student is responsible for contacting the VSU Testing Office (Powell Hall-West, First Floor, Room 1120; Telephone 229-245-3878) and arranging a time to take the ETS Major Field Test in Biology. Students should complete the Major Field Test by the end of midterm week, or Friday, 6 March 2015. A fee is assessed to take the Major Field Test. The Biology Department will pay the fee for each student to take the test once. Students who fail to score at least 140 on the test must re-take it until a score of 140 is achieved. The student will bear the cost for any re-taking of the Major Field Test.*

**Science Seminar Series.** Attendance and completion of an evaluation form is required for all seminars in the Science Seminar Series, starting on January 29, 2015. These seminars are held Thursdays at 4:00 PM in the Powell Hall Auditorium (usually). The schedule with time, date and venue may be found at the following Internet address: <http://www.valdosta.edu/cas/scisem/>. *Evaluation forms will be passed out by the instructor at the entrance to the Student Union Theater up until 4:00 p.m. Any student not in attendance prior to 4:00 p.m. will be considered absent. In order for the student to receive credit for attending a science seminar, it is the student's responsibility to see the instructor immediately after each seminar and submit her/his signed, completed evaluation form.*

### **Plagiarism.**

Plagiarism has become an increasing problem on University campuses. Plagiarism is the representation of someone else's work as your own. You may not blatantly copy phrases, paragraphs, or ideas from another's work. You cannot paraphrase someone else's ideas and use them as your own. You must analyze all data and work by others and then integrate this information with new data and conclusions that you independently synthesize, properly citing past work that supports your conclusions.

Students should read and be familiar with the Biology Department policy on plagiarism: <http://www.valdosta.edu/colleges/arts-sciences/biology/documents/resources/PlagiarismPolicy.pdf> and read and understand the University policy on Academic Integrity: <http://www.valdosta.edu/academics/academic-affairs/vp-office/academic-honesty-policies-and-procedures.php>.

*Each student will be required to read the VSU Biology Department's Plagiarism Policy and to sign a form to be kept on file with the department, indicating they have read and comprehend this policy.*

Additionally, there have been many articles written on what is plagiarism and I refer students to the one referenced here and published in the Chronicle of Higher Education. The link for this article is available from the electronic version of this syllabus on the course web page.

McLemee, Scott. 2004. What is plagiarism? *The Chronicle of Higher Education* 51(17); A9.  
<http://chronicle.com/article/What-Is-Plagiarism-/6962>

In the article by Scott McLemee, the author quotes Joseph Telushkin in a passage that I believe aptly captures the reasons why academicians find plagiarism so ethically abhorrent. The quote by Joseph Telushkin reads, "If a person presents as her own an intelligent observation that she learned from another, then it would seem that she did so only to impress everyone with how 'bright' she is. But if she cites the source from whom she learned this information, then it would seem that her motive was to deepen everyone's understanding. And a world in which people share information and insights to advance understanding, and not just to advance themselves, is one well on its way to redemption."

***Any act of plagiarism in the student presentation of the written paper will result in a failing grade for the term paper and therefore, this course.***

It is imperative that the term paper be the student's own original work. Plagiarism will not be tolerated, and any student caught plagiarizing shall receive a failing grade on the term paper resulting in a grade of unsatisfactory in the course.

### **Written Term Paper:**

Written term papers are due at midterm, specifically by Friday 6 March 2015 at 3 p.m. The term paper must be delivered electronically to Dr. Goddard's email address ([rgoddard@valdosta.edu](mailto:rgoddard@valdosta.edu)) as an attachment in Word format. Additionally, all references cited must be included as hard copies or as pdf attachments to Dr. Goddard. The format of the paper should be sub-headed for ease of reading and include:

A **title page** with the title of the paper, student name, course title (Senior Seminar; BIOL 4900), the name of the instructor, and the submission date.

The body of the paper should have:

An **Introduction** that introduces the reader to the research topic and leads into:

a **Discussion** that will contain a detailed discussion of the subject with primary references cited where appropriate (see additional notes in the "course theme" section).

Finally, you should end your paper with a **Conclusion** that summarizes the student's interpretation of the information in the paper.

**Literature Cited:** The literature cited must contain at least 10 **primary source** research articles. In addition to these, students may choose to add no more than two review articles, and no more than one textbook. No web based references will be accepted unless from an online peer-reviewed journal.

**Format:** All references used must be cited at least once in the body of the paper using proper format. In-text citations are generally written as (Author, year; Author and author, year; or Author et al., year, for one, two, or three or more author papers). For this class we will adhere to the *Instructions to authors for Plant Physiology* that can be found in the first issue of a volume available in the library, or online at: <http://www.plantphysiol.org/misc/ifora.shtml> (pay particular attention to the "Text Requirements" section). At this location are instructions for proper format of journal, book, patent, and other reference types as well instructions for formatting tables and figures or abbreviations needed for the paper.

### **Oral Presentations:**

Oral Presentations will be scheduled later in the semester and will be prepared and delivered using PowerPoint software unless an exception has been previously approved by the instructor. Attendance at all student presentations is absolutely required. Failure to attend any student presentation will adversely affect your grade and could result in your failing this course. All students will evaluate each other's presentation. It is expected that students will be critical in these evaluations and will be able to justify their evaluation for each of their colleagues. Student evaluations will be used as part of the criteria for their participation grade for this course (below).

Students must electronically send a copy of their PowerPoint presentation as an attachment to Dr. Goddard at [rgoddard@valdosta.edu](mailto:rgoddard@valdosta.edu) at least four hours in advance of their seminar, but preferably earlier to insure compatibility with the classroom computer.

### **Class Participation:**

Students are expected to attend all scheduled class periods and this will count towards your grade. Students are also expected to ask questions and participate in discussions about other student's topics and presentations. Students should provide an email address to the instructor in the first week of class by emailing [rgoddard@valdosta.edu](mailto:rgoddard@valdosta.edu) from their preferred email address. The content of the email should contain your choice of topic for the paper and presentation. Topics are assigned on a first come, first served basis; the first email received requesting the plant natural product will get that topic. If someone else has chosen that topic, you will be notified and then must choose another natural product to work on (more on topics below).

**FERPA:** The Family Educational Rights and Privacy Act (FERPA) prohibits the posting of grades by social security number or in any manner personally identifiable to the individual student. Grades will not be posted by social security number or by name. Students will have the opportunity to have their grades posted by a unique alphanumeric sequence identifiable only by the student and the professor. No grades can be given over the telephone, as positive identification cannot be made by this manner.

**Students with Disabilities:** Students requiring classroom accommodations because of documented disabilities should discuss their needs with the instructor at the beginning of the quarter. Disabled students not registered with the Special Services Program should contact the program officer in Nevins Hall 1115 (phone: 245-2498).

### **Grading:**

Outline of Research paper	10 pts
Written Presentation	40 pts
Discussion/Participation	10 pts
Oral Presentation	<u>40 pts</u>
<b>Total:</b>	<b>100 pts.</b>

### **Deductions to grade:**

Plagiarism found in paper – automatic zero for paper	
First absence from a scheduled class or science seminar	-10 pts.
Second absence from a scheduled class or science seminar	-40 pts.
Failure to complete the MFT with a 140 or higher	-40 pts.
Failure to complete the senior exit questionnaire	-20 pts.
Late papers/outlines/scheduled talks (each occurrence/day)	-10 pts.

This class is graded Satisfactory/Unsatisfactory. Your final grade must be equal to, or higher than 70 to receive a satisfactory grade.

## **Course Theme: Pharmaceuticals from Plants.**

Natural products have been used in traditional healing throughout history. A large number of OTC and prescription drugs used in medicine today are derived from plant sources. For each topic, it will be necessary to describe the particular chemical extracted from plants and used as a drug and present a two part analysis for their paper. First, the origin of the drug regarding its natural history should be outlined; describing the plant or plant family and presenting the possible reasons for the natural occurrence of the chemical derivative. Second, each student will outline the disease/disease symptom that the chemical treats in human disease and offer a description of the molecular mechanism of the drug and its efficacy in treating disease symptoms.

Finally, students should present any other useful or interesting information about the plant derived chemical (e.g. folklore).

Students may work on herbal remedies as long as there is knowledge available to develop a paper on how a particular natural product works in treating or healing health ailments.

### **Additional Instructions for Seminar Talk Presentation**

1. Talks are expected to be professional in nature.
  - a) Delivered on assigned date
  - b) Organized
  - c) Well spoken (adequate volume, elocution)
  - d) Practiced
  - e) Substantial / non-superficial
  - f) Demonstrate a clear mastery and understanding of the topic and relevant biology
2. Talks should last about 20 min. with an additional 5 minutes allowed at the end for questions and discussions.
  - a) Deduction for talks lasting less than 17 min.
  - b) Deduction for talks that go over 20 min.
3. Talks should be prepared using PowerPoint  
Note: PowerPoint allows for vast amounts of graphic design for presentation slides. Good graphics matter only in so far as they actually contribute to the clarity of the presentation. Please do not waste huge amounts of your time on meaningless, computer graphic tricks assuming they will generate a better grade.
4. Talks should be well organized summaries of:
  - a) Introduction of the topic
  - b) Explanation of the biology/ interest/ problem
  - c) Discussion of the technical aspects of the science and methods used to study the question
  - d) Discussion of what the data drawn from these methodologies are
  - e) Conclusions drawn from the data - what do the data mean?
  - f) Your opinions and /or projections based upon your research.
5. If any reference material is directly cited, citations should be included on the relevant slide (This includes 'borrowed' graphics! Be sure to give credit where credit is due.
6. Handouts may be prepared directly from PowerPoint and given to the class as a guide if so desired
7. You are expected to be practiced and ready to deliver your seminar on the date assigned. Very limited exceptions may be made. There are no free seminar dates available. If you miss your own seminar, you will receive a zero and it cannot be made-up.

### **Additional Instructions for Paper Presentation**

1. Choose a topic from the list provided, or, suggest one of your own for approval by the instructor. Choose a topic, or some aspect of that topic, which can be reasonably and thoroughly discussed in the confines of this assignment. Avoid being too broad and general. There is some overlap in the content of the topics provided. Stay on track for your topic.
2. Research that topic well in the literature. Note that information content is critical. Specific, detailed and well-understood information to support your thesis is required.
  - a) Each paper should have a title page. Text should be centered on the title page. It should contain only: Paper title, authors name, course name and number, and the date on which the paper is submitted. This page should not be numbered

- b) Each paper must have a summary abstract at the beginning. Abstracts are limited to no more than 250 words. Abstracts should be on a separate page after the title page and this page should not be numbered.
  - c) **Text:**
    - i) Begin numbering pages with the introduction page and continue numbering through the references
    - ii) Papers should contain the following sections identified by headings: Abstract, Introduction, Plant Natural History, Molecular function of the chemical, Conclusions, and References. Additional subheadings pertaining to content may be added.
  - d) Each paper should be well supported by ample references. References must be cited in text where appropriate and listed in correct format, in alphabetical order, in the reference section of the paper. Since students always ask, a minimum of 10 primary source references are required, however, most will need to find more to do their topic justice. And, yes, I will take off even if 15 are used, but the topic is not well developed and supported.
    - i) **References MUST come from professional, peer reviewed, primary research or secondary review sources.**
    - ii) **References MAY NOT be web pages.** You may use the web to search data bases and find appropriate, original literature. You may use the internet to find and download original, full text articles. You may use Galileo to locate abstracts and citations, but you **MUST** find, read and include the entire article from the peer-reviewed journal. Photocopies or pdf's of each cited article must be turned in with the final draft of your paper.
    - iii) Any references cited simply as web pages will be discounted from the grade – heavily – with few exceptions.
3. An general outline of the paper is due by the end of the second week of this class. This outline should cover the basic premise of the paper, its general sections and structure and include as much specific information as possible. It also must include a list of references gathered to that date. Take these seriously, as they will be one chance for me to give you feedback on your progress **BEFORE** a grade is written.
  4. Paper text should be at least 10 double spaced, pages in length (Introduction through Conclusions). Try to limit papers to a maximum of 12 pages. Text must be in 12 point Times New Roman font. One inch margins are required.
    - a) Paper length does NOT include references, they are an extra requirement.
    - b) Paper length does NOT include the Abstract or title page, they are extra requirements.
    - c) Paper length does NOT include figures, unless an original figure is generated by the student. If figures are used, each figure must be on its own page and have an appropriate figure caption as formatted in the "*Instruction to Authors*"
    - d) Papers must be well written.
      - i) Correct English grammar is required
      - ii) Correct punctuation is required
      - iii) Clear, readable, understandable, complete sentences are required.
      - iv) Bulleted or numbered lists are generally not allowed
      - v) **If quotations are used, they must be short and to the point and they must be appropriately cited. Absolutely only one quotation will be acceptable; more will indicate a failure by the student to adequately synthesize the information and report on it.**
  5. Text should follow the "*Instructions to Authors*" provided from *Plant Physiology*. **Generally we are exposing students to professional methods of information dissemination that scientists use. All primary source journals will have an "instructions to authors" section, usually in the first edition of a new volume, that functions to guide authors in the proper preparation of their scientific papers for publication in that journal.** All details; margin requirements, headings, punctuation, abbreviations, and literature citation formats are included in these 'rules' for authors.

### Possible plant derived natural products or developed drugs:

Aconitine	Chaulmoogra Oil
Aloe glucosides	Cocaine
Artemisinin	Catechin, epicatechin, epicatechin gallate, epigallocatechin gallate (EGCG)
Aspirin	Colchicine
Atropine & Hyoscyamine (Tiotropium derivative of atropine)	Colocynth (glucoside)
Buchu (essential oil)	Combretastatins
Capsaicin	Croton Oil
Cascara	Cubeb's oleoresin
Chamomile essential oil	Curarine / Curare

Digitoxin  
Dronabinol and Cannabidiol  
Ellipticine & podophyllotoxins  
Emetin (Ipecac)  
Ephedrine  
Etoposide & Teniposide  
Eucalyptus (Essential oil)  
Flavopiridol  
Forskolin and phytochemicals from  
    Stephania glabra,  
Ginseng  
Guaiacum  
Hamamelis (Witch Hazel, a tannin)  
Hyoscyamine and Scopolamine  
Licorice  
Lobelia alkaloid  
Lupulin  
Morphine  
Nitisinone derived from natural product  
    Leptospermone  
Nux Vomica (strychnine and buccine)  
Opium  
Pennyroyal  
Physostigmine

Pilocarpine  
Pomiferin  
Psyllium  
Quassia  
Quinine  
Reserpine  
Rhubarb  
Roscovitine  
Santonin  
Senega  
Senna  
Silymarin  
Squills (glucosides)  
Strophanthus  
Sulforaphane  
Taxol / Paclitaxel  
Tetramethylpyrazine (TMP)  
Tetrandrine (TET)  
Topotecan & Irinotecan  
d-Tubocurarine  
Valerian  
Vincristine & Vinblastine  
Wormseed  
Wormwood essential oil