Lecture: Thursdays 7:00-9:30 pm  ST 107

Instructor: Gregory W. Buck, Ph.D.  Office—CS251; Gregory.Buck@tamucc.edu
Tel 361.825.3717  Office Hours: Mon  Wed 10:00 a.m.-11:00 a.m. (except Feb. 12, Mar. 19, Apr. 9), Tues  1:00 p.m.-2:00 pm  Other days & times--preferably by appointment.

Course Description: This course is designed for M.S. students in Biology, Microbiology, Molecular Biology, Environmental Sciences, Marine Biology or Mariculture. This course will cover representative viruses in the three main groups of viruses infecting bacteria, animals, and some plants. The course will cover classification of viral groups, types of viral replication, molecular methods used to answer fundamental questions in virology. Some elements of emerging viral diseases will be covered, and students will be expected to know the molecular basis of pathogenesis (how viruses cause disease), but the course does not aim to survey medical aspects of virology and taxonomy described in professional school (MD, DO, DVM, DDS), nor viral treatment modalities.

Purpose: The course is offered to give graduate students a detailed survey of current literature on molecular virology by reading, critically analyzing, and discussing primary journal articles that focus on current virology research. Graduate students will also learn how to teach complex information to undergraduate students. Finally, graduate students will learn how to write a mini-grant in NIH format, a very useful skill for any future in science.

Audience Defined: This course is for first-year M.S. students who have not previously taken a course in virology at the college level.

Prerequisites: A general-level sophomore introductory course in microbiology (Texas Common Course no. BIOL 2421 or its equivalent) using one of the following texts: Alcamo, Baumann, Lin, Harley and Prescott, Nester et al., Madigan et al. Persons having taken a mixed majors microbiology class (Common Course no. BIOL 2420) using the texts of Batzing, Talaro and Talaro, or Totora, Funke and Case will need to supplement their knowledge base, and should discuss this with the instructor before taking the course. Also required are courses equivalent to genetics (BIOL 2416) at the level of Brooker, Hartl, Russel, Lewontin, Snustad or other texts, and organic chemistry (CHEM 3412). While not required, coursework in molecular biology (BIOL 3403) at the level of Watson, Weaver or Lewin; biochemistry (CHEM 4401/2) at the level of Stryer, Voet, Lehninger, or Devlin; and immunology (BIOL 4406) at the level of Abbas and Lichtman, Kuby, or Roitt would be of immense help.

Readings: Two texts are recommended; all others are strongly suggested. Please use Council of Biology Editors citation style; you may find this in Bell Library. Note that the ISBN number is NOT part of the CBE bibliographic style. For web sites, the date accessed MUST be placed in the citation. Texts indicated with (#) are available in Bell Library; graduate students are expected to read additional journal articles referenced in
the assigned articles, most of which may be found on-line in the Bell Library using electronic retrieval services.

**Bibliography** (* indicates in TAMU-CC bookstore)—Please use this format when writing bibliographies for your grant proposals

**Required Textbooks**

**Suggested Readings:**

**Student Learning Outcomes**
Upon completion of this course, students will be able to—
1. Describe the structure and components of viruses;
2. Explain various cellular and molecular different techniques used in virology, along with their advantages and limitations;
3. Describe the different classification schemes of viruses;
4. Distinguish between various types of viral replication between positive and negative-stranded DNA or RNA viruses;
5. Explain the molecular basis of pathogenesis for diseases caused by selected viruses;
6. List emerging viral etiological agents;
7. Critique scientific methodology and approaches in studying the etiology of viral infectious agents;
8. Refine skills in critical thinking and writing through analyzing current primary literature;
9. Write a credible, ORIGINAL grant proposal in NIH or NSF format;
10. Present scientific material orally in a form appropriate to the targeted audience;

**Class Grading Scale**

**Evaluation:**
1. Three exams (300 pts.); these exams will be a mixture of short answer, essay, multiple choice (including Type K), descriptive T/F, and cases. Exams may be in-class or take-home. The final exam, which may or may not be cumulative, is mandatory for graduate students. Class exams are 75-90 minutes in length. The take-home exam will have a finite time limit outside of class. You are free to use any sources for the take-home exam, including any materials on-line, in the library, from your peers in the class. However, you are NOT free to ask faculty at TAMU-CC or elsewhere, or graduate students elsewhere. I also reserve the right to “split” the exams into take-home and in-class components.
2. Two Case Histories/Presentation (50 pts.)—These studies, which may be based on viral diseases, will be done in class as groups unless otherwise noted.
3. Paper Discussion (25 pts)—I expect everyone to be prepared to lead class discussions of primary journal articles. I will expect 1-3 randomly-chosen individuals (including one grad student) to lead discussions each class, and I will grade these persons. To make sure people don’t rest after their time, I will also give quizzes to the class. I can ask all students to do more than one presentation, and take the higher grade of the multiple presentations. If you cannot lead the class when you are asked, I will give you another opportunity if there are valid emergency reasons (family illness or accidents, deaths, funerals). Other events (professional school and job interviews) will be determined on a case-by-case basis. For nonlegitimate excuses (as determined by professor), as a graduate student you will receive a zero for that assignment.
4. Quizzes/Article summaries (75 pts)—I will give at least three (3) quizzes or article summaries, worth 25 pts.each. Quizzes may cover lecture material, primary journal articles, or reviews given in class. As grad students, I may use the quiz to determine if you have read the journal articles!
5. Papers (150 pts): You must turn in a mini-grant proposal in NIH or NSF format (former preferred), worth 100 pts. The proposal will consist of the following sections: Specific Aims/Project Description, Background/Significance, Experimental Design, Timetable, Bibliography. This proposal should consist of 7-10 pages, excluding cover page) on a virus of your choice—I may allow grad students to do a virus we cover in class or in case studies, but on a different research focus. This paper will include formulation of at least two separate Specific Aims that are hypothesis-driven, with the experimental design logically following from the Specific Aims. The bibliography must
contain at least 10 sources, of which 7 must be primary literature and a maximum of 1 review and 1 Internet source.

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The final date for deciding which virus will be the subject of your proposal is due Jan. 25.

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The draft grant proposal is due March 1, and worth 50 pts. This draft means plagiarism will not be tolerated, from the Internet or from others.

--The final grant proposal is due April 12, and is worth 100 pts. **I WILL NOT ACCEPT LATE GRANT PROPOSALS FROM GRAD STUDENTS**—if you think you might be late, turn it in early!

6. **Grading**

3 exams (including mandatory final exam, which may not be cumulative)

<table>
<thead>
<tr>
<th>Item</th>
<th>Points</th>
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<tbody>
<tr>
<td>3 exams each</td>
<td>100</td>
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<tr>
<td>2 case histories/presen. each</td>
<td>25</td>
</tr>
<tr>
<td>3 Quizzes/article summaries each</td>
<td>25</td>
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<tr>
<td>1 Paper discussion</td>
<td></td>
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<tr>
<td>Draft Grant proposal</td>
<td>50</td>
</tr>
<tr>
<td>Final Grant Proposal</td>
<td>100</td>
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<tr>
<td>Power Point Presentation</td>
<td>100</td>
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</tbody>
</table>

**Max. 700 pts.**

**Scale (out of total points)**

A>90% B=80-89.9% C=70-79.9% D=60-69% F<60%

7. **Power-Point Presentation (100 pts):** I expect each grad student to give a 15-20 minute Power-point™ talk involving some aspect of their grant proposal to the class. You must include the general aspects of the virus studied (viral type, replication, host, diseases caused, unique features of virus); you may want to discuss why your proposal is worth studying, and what you hope to accomplish. This presentation will be done on April 26.

8. **Extra Credit assignments** may be given at prerogative of instructor, either as case histories, Internet assignments, seminars, guest lectures, or journal articles to read/summarize.

9. **Missed exams—**Excused only per TAMUCC guidelines; such exams are given only under EXTREME circumstances, and will be total essay.

10. **Missed Case Presentations—**Make-up work given only under EMERGENCY circumstances as defined by TAMUCC catalogue and Student Handbook, and may involve writing a 3 page precis of a 10+ page journal article.

**N.B: Instructor reserves the right to assign talks by visiting seminar speakers as an extra case history not included in the two (2), or as a make-up.**

11. TAMUCC academic policies are in force, including standards for academic integrity & honesty, grammar and spelling. All policies are described in the TAMUCC catalogue and Student Handbook. References must be properly cited using the Council of Biology Editors (CBE) style. Modifications (e.g., ASM versus NEJM) are irrelevant, provided that all references are consistent. Failure to cite references (even web sites) constitutes plagiarism. The instructor will determine if plagiarism was intentional or unintentional; the former will result in a zero for the assignment; the latter will result in reduced credit.
12. Deadline to drop course: March 30, 2007
Deadline to withdraw from all university classes: April 30, 2007

Important dates:
Grant Proposal topic due—Jan. 25
Exam 1—Feb. 15 (Note: Take-home portion, if done, may be given earlier)
Draft Due—Mar. 1
Exam 2—Mar. 8 (Note: Take-home portion, if done, may be given earlier)
Drop Date—Mar. 30
Graduate Power Point Presentations—Apr. 26
Final Paper Due—Apr. 12
Final Exam (MANDATORY FOR GRAD STUDENTS)—R 7:00-9:30 p.m., May 3 (Tentative)

Rules
Attendance: Students are expected to attend every scheduled class meeting. It is the responsibility of the student to obtain any material missed during an absence from his/her classmates. I do not provide copies of overheads or Power Points.

Excused absences: Family events and birthday celebrations are not classified as excused absences. If you book an airplane flight before Spring Break which conflicts with class, I do NOT consider that to be an excused absence. Routine events should be scheduled to avoid class conflicts. In general, only unavoidable absences are excused (major family illness or accidents, deaths, funerals). Other events (professional school and job interviews) will be determined on a case-by-case basis. A note from a doctor, dentist or funeral director is necessary to receive an excused absence. All notes should be received within one week of the absence.

***Please turn off all cell phones, beepers, PDAs, Black Berries, Palm Pilots, etc., before entering the classroom, or at least place them on silent mode.

Disabilities
Students with Disabilities: The Students with Disabilities Center is located in the Student Services Center (361.825.5816). If you have special needs, please contact this center. I cannot make modifications without the center’s involvement, even if you show me the IEP. If you have mobility problems, please notify me so that assistance can be given in case of fire drills or emergencies.

List-serves
Graduate students are required to subscribe to two list-serves. One list-serve allows the instructor to give you notes and send messages; this list-serve is the Virology list-serve. Another list-serve describes opportunities available in science. To subscribe, send a separate e-mail to both biol4304-list-request@sci.tamu.edu and to opportunities-list-request@sci.tamu.edu. Make sure that your e-mail appears in the “From” heading. In the subject heading, type “subscribe,” then send the e-mail. Next, you will receive a second message with a long set of letters and numbers in the subject line. You must also reply to that message in order to be subscribed to the list-serve.
After the initial message to subscribe, to send items on the list-serve, just type biol4304-list@sci.tamucc.edu (do NOT add –request after list). You may not receive the messages from the list-serve if your Internet service provider (Yahoo, Hotmail, Excite, Roadrunner, Grande, etc.) filters these messages. You may have to adjust the filters on your inbox to keep these messages from being placed in junk-mail. Suggestion: Get a student account at tamucc.edu!

At the end of the course, if you want to unsubscribe to both list-serves, send an e-mail that contains your e-mail address in the “From” heading. In the subject heading, type ”unsubscribe,” then send the e-mail.

Caveats
The syllabus is a general guide; deviations may be necessary. Responsibility to keep up with the changes in the syllabus lies with the student!

### Virology 5304 Schedule of Topics Covered  Spring 2007  Dr. Buck
WH=Wagner & Hewlett; C=Cann

<table>
<thead>
<tr>
<th>Wk</th>
<th>Date</th>
<th>Topic</th>
<th>Text</th>
<th>Paper(s)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Jan. 11</td>
<td>Introduction to Virology; Molecular methods in virology—Part I</td>
<td>1, 5, 6, 9-12, (WH); 1, 3, 4(C)</td>
<td>No paper</td>
<td>Also Appendix 2 (C)</td>
</tr>
<tr>
<td>2</td>
<td>Jan. 18</td>
<td>Viral Pathogenesis/Immunology</td>
<td>3, 7, 8 (WH); 6, 7 (C)</td>
<td>Guo, H.G. et al. (2004) Tumorigen. of HHV-8 vGPCR … J Virol 78 (17), 9336-42</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Jan. 25</td>
<td>ss/ds (+) RNA viruses</td>
<td>15 (WH); 4 (C)</td>
<td>Glass et al. (2005), CCR5 promotes...WNV survival. JExpMed 202(8), 1087-98</td>
<td>Term paper/ grant topic due</td>
</tr>
<tr>
<td>4</td>
<td>Feb. 1</td>
<td>Molecular methods in virology—Part II</td>
<td>9-12, 22(WH); 3 (C)</td>
<td>TBA</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Feb. 8</td>
<td>No Class; Case Study I</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Feb. 15</td>
<td>(-) stranded RNA viruses</td>
<td>16 (WH)</td>
<td>Childs et al. (2006) mda-5 a target for paramyxovirus doi: 10.1016</td>
<td>Exam 1</td>
</tr>
<tr>
<td>Week</td>
<td>Date</td>
<td>Topic</td>
<td>Code</td>
<td>Due Date</td>
<td>Notes</td>
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<tr>
<td>7</td>
<td>Feb. 22</td>
<td>Retroviridae</td>
<td>20, 21 (WH); 3 (C)</td>
<td>Lesner et al (2006) HIV. J Immunol 175, 2548-2554</td>
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<tr>
<td>9</td>
<td>Mar. 8</td>
<td>DNA Viruses II: Adeno, Parvo, Papilloma</td>
<td>17 (WH)</td>
<td>TBA</td>
<td>Exam 2</td>
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<tr>
<td>10</td>
<td>Mar 15</td>
<td>Spring Break</td>
<td></td>
<td></td>
<td>No Class</td>
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<tr>
<td>15</td>
<td>Apr 19</td>
<td>Subviral Agents; Case Study II</td>
<td>7,16 (WH); 8 (C)</td>
<td>Wurm (2006). Biochem Biophys Res Com 349, 525-532</td>
<td>Grad students lead class</td>
</tr>
<tr>
<td>16</td>
<td>Apr 26</td>
<td>Environmental virology</td>
<td>Not in text</td>
<td>Formiga-Cruz et al, (2005),J Virol Meth 125, 111-118</td>
<td>Graduate student Presentations</td>
</tr>
<tr>
<td>17</td>
<td>May 3</td>
<td>Final Exam</td>
<td></td>
<td></td>
<td>Mandatory for graduate students; optional for undergrads</td>
</tr>
</tbody>
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Virology 5304 Rubric for Powerpoint Presentations Spring 2007  Instructor edition

Name of presenter ___________________________   Start time_____   End time _____

Directions: Score as follows:
0= Missing    1= Poor    1.5= Suboptimal    2=Fair    3= Good    4=Very Good    5=Excellent

Format
1. Student has 20-25 legible slides with consistent format, background, and color scheme ______
2. Narrative slides do not have too many words/facts on a single slide ______
3. Narrative slides contain tables, figures, and graphs that help to tell the story____
4. Graphs/tables are clear, concise and accurate with correctly-labeled axes, labels____
5. Order of presentation tells a clear, logical story of the information presented. ______

Content
1. Student had sufficient knowledge about area of presentation. ______
2. Student understood area well enough to explain content. ______
3. Student presented scientific content in a coherent fashion. ______
4. Student cited/acknowledged work done by others. ____________
5. Student topic derived from original idea that was expanded. ______

Oral Presentation of Power Point Presentation
1. Presenter spoke in 15-20 minutes. ______
2. Presenter gave presentation in IMRAD form_____
3. Presenter clearly articulated major points of the work._____
4. Presenter gave a talk that was concise in describing work presented. ______
5. Presenter gave a talk that was relatively free of grammatical errors. ______
6. Presenter adequately handled questions at the end of the presentation._____
7. Presenter spoke without many pauses, giggles, “uhs,” “you knows,” and “likes.” ______
8. Presenter exhibited professionalism in making presentation. ______
9. Presenter gestured to words/graphics._____
10. Presenter talked to audience, not to wall, slides, or inanimate objects. ______

Final score given by instructor ______
Average number of points from peers_____
Average of two scores ____________
(Score avg/100)= ____________ Final Grade
Grant Proposal Rubric  BIOL 5304 SP07  Name of student ____________________

Criteria for draft: 0= Missing  0.5=Suboptimal  1.0=Average  1.5=Good  2.0=Great

Format of Proposal (16 points)
1. Student used past tense. ______
2. Student has 7-10 pages, excluding cover page and bibliography. ______
3. Student used third person nominative and objective forms.______
4. Grammar and spelling ______
5. Proposal in Bkgd/Obj./Design & Outcomes/Timetable/Budget/Ref. format. ______
6. Appropriate formatting (double-spacing, numbered pages, indented paragraphs)______
7. Abstract follows appropriate style, and limited to 250 words ______
8. Overall proposal is in either NIH (preferred) or NSF format.______
Format subtotal______

Content (34 pts)
1. Background/Introduction …
   a. contains information about what is/is not known. ________
   b. justifies why the unknown information will advance science.____
   c. describes the long-term goals, the problem or hypothesis. ______
   d. Proposal can be done by researcher. ______
2. The Objectives section…
   a. contains 2-3 Specific Aims that will answer questions posed in hypothesis.____
   b. contains Specific Aims that are non-sequential. ______
   c. contains plausible results with each Specific Aim._______
   d. accurately describes how the results confirm the hypothesis. ______
   e. describes alternative experiments that will answer the hypothesis. ______
3. A timetable is included._______
4. A budget is included. ______
5. Literature is cited clearly throughout paper, using (name, date), or reference numbers follow those in References. ______
6. The style is consistent throughout the references. _____
7. Ten references are seen, with
   a. seven references being from primary literature. ______
   b. No more than one review is cited_______
   c. Style of references is consistent._______
   d. Critical references are included_______
Final Score ________ (50 pts draft)