

## Final Course and Instructor Evaluations

### CHEM-342 - Introduction to Biochemistry - Spring 2009

Instructor: Harold B. White, III

The following are the responses of all 20 registered students to the University of Delaware's on-line course evaluations conducted during the last week of classes.

| Question  | Strongly Disagree | Disagree | Neither | Agree | Strongly Agree | Total (20) | Mean | Std. Dev |
|---|-------------------|----------|---------|-------|----------------|------------|------|----------|
|   | 1                 | 2        | 3       | 4     | 5              | N          |      |          |
| The course was well organized.  | 0                 | 1        | 0       | 9     | 10             | 20         | 4.4  | 0.75     |
| The course textbook was very useful.  | 0                 | 5        | 10      | 3     | 2              | 20         | 3.1  | 0.91     |
| The course examinations emphasized understanding of the material.   | 0                 | 1        | 1       | 6     | 12             | 20         | 4.45 | 0.83     |
| The course emphasized understanding of the material rather than memorization.   | 0                 | 0        | 0       | 5     | 15             | 20         | 4.75 | 0.44     |
| Overall, I learned a great deal in this course, including factual knowledge, principles of behavior, or skills.   | 0                 | 3        | 1       | 5     | 11             | 20         | 4.2  | 1.11     |
| I found the visit by Dr. Howard Dintzis to the class definitely worthwhile.   | 0                 | 1        | 1       | 6     | 12             | 20         | 4.45 | 0.83     |
| I found the visit by Dr. Carlton Cooper to the class definitely worthwhile.   | 0                 | 0        | 2       | 7     | 11             | 20         | 4.45 | 0.69     |
| The process-oriented guided inquiry learning (POGIL) activities (e.g. protein crystallization for Zinoffsky, experimental decisions relating to Dintzis, and natural selection on hemoglobin for Allison) should be used in future offerings of CHEM-342. | 0                 | 1        | 2       | 12    | 5              | 20         | 4.05 | 0.76     |
| It would be a good idea to form new groups after midterm.   | 7                 | 7        | 3       | 1     | 2              | 20         | 2.2  | 1.28     |
| Peer evaluation of student performance within groups was a worthwhile activity  | 0                 | 2        | 4       | 10    | 4              | 20         | 3.8  | 0.89     |
| My group would have done fine without a tutor-facilitator   | 7                 | 9        | 2       | 2     | 0              | 20         | 1.95 | 0.94     |
| I think examinations in CHEM-342 should focus more on factual information and less on problem solving.  | 5                 | 6        | 8       | 1     | 0              | 20         | 2.25 | 0.91     |
| The assignments I turned in were graded and returned promptly.  | 0                 | 0        | 2       | 2     | 16             | 20         | 4.7  | 0.66     |
| A considerable amount of the material in CHEM-342 reviewed material I had studied in other courses.   | 0                 | 7        | 4       | 8     | 1              | 20         | 3.15 | 0.99     |
| It was a bad idea to change tutor-facilitators after Spring Break.  | 5                 | 5        | 4       | 6     | 0              | 20         | 2.55 | 1.19     |
| My jigsaw group's concept map reflected mostly the efforts of one or two group members.   | 3                 | 5        | 1       | 10    | 1              | 20         | 3.05 | 1.28     |

CHEM-342, Introduction to Biochemistry, final Course and Instructor Evaluations, Spring 2009

|  |   |   |   |    |    |    |      |      |
|--|---|---|---|----|----|----|------|------|
| I think grades in CHEM-342 should be based solely on individual performance.                                       | 3 | 9 | 7 | 1  | 0  | 20 | 2.3  | 0.80 |
| I talked about subjects and issues arising in this course with people not enrolled in the course.                  | 0 | 2 | 9 | 7  | 2  | 20 | 3.45 | 0.83 |
| I feel that I can apply the general principles I learned in CHEM-342 to problems in other courses.                 | 0 | 0 | 1 | 11 | 8  | 20 | 4.35 | 0.59 |
| I found the hemoglobinopathy assignment worthwhile.  | 1 | 1 | 3 | 9  | 6  | 20 | 3.9  | 1.07 |
| As a result of this class my ability to find, read, and analyze information has improved.                          | 0 | 0 | 1 | 6  | 13 | 20 | 4.6  | 0.60 |
| I feel confident that I can read and understand research articles.   | 0 | 1 | 1 | 8  | 10 | 20 | 4.35 | 0.81 |
| I am comfortable working in groups.  | 0 | 0 | 3 | 12 | 5  | 20 | 4.1  | 0.64 |
| I feel comfortable sharing information.  | 0 | 1 | 1 | 11 | 7  | 20 | 4.2  | 0.77 |
| I feel comfortable asking help from others.  | 0 | 1 | 1 | 13 | 5  | 20 | 4.1  | 0.72 |
| I feel comfortable in relying on information obtained from others.   | 0 | 3 | 6 | 8  | 3  | 20 | 3.55 | 0.94 |
| Given the opportunity, I would like to take another class designed like this one.                                  | 2 | 0 | 3 | 6  | 9  | 20 | 4    | 1.26 |
| Discussion of the mystery molecules helped me make connections to things I had learned in other chemistry courses. | 1 | 2 | 3 | 10 | 4  | 20 | 3.7  | 1.08 |
| I found the course web-site to be a useful resource.   | 0 | 0 | 0 | 9  | 11 | 20 | 4.55 | 0.51 |
| I found the quotations on the board thought provoking.   | 0 | 1 | 6 | 8  | 5  | 20 | 3.85 | 0.88 |
| I enjoyed working in the jigsaw group for one week.  | 3 | 2 | 4 | 8  | 3  | 20 | 3.3  | 1.30 |
| My group made use of the classroom library   | 0 | 5 | 5 | 7  | 3  | 20 | 3.4  | 1.05 |
| I found the scratch-off group-quiz format a useful learning activity.  | 0 | 0 | 1 | 13 | 6  | 20 | 4.25 | 0.55 |
| Having a group outing at the beginning of the course helped my group to work well together.                        | 0 | 1 | 9 | 6  | 4  | 20 | 3.65 | 0.88 |
| Overall, I would rate this class:  | 0 | 1 | 3 | 6  | 10 | 20 | 4.25 | 0.91 |

| Question   | 1 - 0 | 3 - 2 | 5 - 4 | 7 - 6 | 8 or more | Total (20) |
|--|-------|-------|-------|-------|-----------|------------|
| On the average, the number of hours per week I spend working on this course outside of class is: | 3     | 9     | 6     | 2     | 0         |            |

## Essay Responses for CHEM-342 Section 010 for 2009 Spring

### Question ID: 3436 Comment on the course.

Responses (15 of 20)

- Please see my previous comments.
- Definitely one of the best courses I have ever taken. The lessons I learned extend well beyond biochemical facts about hemoglobin
- Sometimes it was difficult to tell what was going to be on the exam. Thought that sometimes I was able to understand all of the concepts on the articles but then the exam would ask me specific knowledge questions.
- Great course. The course was a lot of work, and at times the workload seemed overwhelming in combination with the workloads of other courses. Despite this, the course was interesting, stimulating and enjoyable.
- A lot of the concepts [of the articles] were hard to comprehend at first. Of course that got easier after each additional article was read. A lot of the time, I had trouble looking up the right information, or even deciding that the information I was looking up was what I needed to be looking up. I feel that this course is an excellent gateway into the research branch of the scientific world.
- This was both a relaxing course and a challenging course at the same time.
- The course had an interesting subject and it did help me learn how to read articles better, with more understanding.
- Overall, it was a very helpful and interesting course with PBL. It not only introduced me to basic biochemistry concepts but also showed me how I should be learning from articles and not just text books.
- The course was very challenging and time-consuming for an introduction course. The course allowed me to learn how to understand concepts at a much deeper level than ever before through individual research and group cooperation. The course provides a solid background in both biochemistry and advanced methods for learning in the future.
- Most of the time difficult, FRUSTRATING, constant group work adds the added pressure of getting along with people on top of learning biochemistry. However, I was surprised that the midterm was actually do-able and fair. We do learn a lot in this class, but the way it is set up puts us through UNNECESSARY stress
- An excellent class.
- I think we should have had more time for the Zinoffsky article, but I think the unusual snow day is the reason that the time was cut short. Other than that, I thought the course went pretty well. I won't fully know the extent of its usefulness until I take CHEM641 next fall, but as of now I feel like it definitely helped a lot.

- Although I understand the benefits of group work, working only in groups can work extremely well or can be a serious detriment to members of the group. Group grades based on the amount of participation of all the members did not always reflect personal effort.
- It was a good learning experience, although it would be nice to have an idea of what my final grade will be throughout the course,
- It was enjoyable

**Question ID: 3607 In an informative sentence or two, describe or characterize CHEM-342 to someone who might consider taking the course, e.g. What is the essence of this course?**

Responses (16 of 20)

- Chem 342 is very different than a traditional college course. There is very little lecture and much of the learning is put on the students. Most of what you learn comes from researching the issues that you do not understand in each article.
- The course is designed to facilitate learning and to help guide future learning. Hemoglobin and sickle cell were focuses that allowed us to learn to delve deeper into issues, to read and understand scientific articles. Conceptual understanding and the ability to apply it to new situations was stressed.
- Teaches about a number of different concepts relating to how the structure of molecules in the body relate to their function
- This course uses the essential biochemical protein hemoglobin as a vehicle for transforming students who are given information in classes into students who seek to understand where that information came from and what it reveals about the world that surrounds them.
- At first it may seem like you're just going to learn about hemoglobin. Well, that's true, but the way you learn it is the key. You will certainly be challenged in ways you'd prefer not to be, however, you will never walk away empty-handed.
- This course teaches you how to understand scientific documents while teaching you about the properties of hemoglobin and the abnormalities of sickle cell anemia.
- The essence of this course is hemoglobin, but the point is to learn how to do research, read articles, and work in groups.
- The essence of the course is not about learning information and biochemistry concepts (although many will be picked up on the way) but rather the fundamentals of how scientific thought and progress should be carried out in the search for knowledge.

- This course teaches fundamental concepts of biochemistry that can be applied to more advanced courses. In doing so, the student discovers new levels of understanding, new ways to cooperate successfully in groups, and new methods of learning that can be used throughout a lifetime.
- The goals of Chem 342 are to teach the skills necessary to read, analyze, and understand scientific articles, and to research and properly report the work of others both orally and on paper. In the process, this class is designed to give us an introduction to biochemistry in order to better prepare us for Chem 641 next year.
- The class is about learning how to read a scientific article correctly and understand it.
- Learning about science can in fact not be a complete pain.
- The purpose of the course is to help you learn how to learn. In other words, it helps you learn how to gather information on your own in order to understand something - in this case, scientific articles - more fully.
- Anyone looking to further their knowledge and understanding of the basic principles and methods of learning biochemistry should take this course.
- Know the strengths and weaknesses of your group.
- Your efforts are not just for the sake of learning about the articles and understanding its concepts, but helping the group understand.

**Question ID: 3611 Open “Microphone” Reflect on the course and identify those aspects that you like or think could be improved. Please suggest ways for improvement.**

Responses (14 of 20)

- More clear instruction given for some assignments. A few ideas to guide students at the beginning of each article.
- More lectures
- Overall, this was a very good course. The professor might notice a disparity between the scores on an individual's portions of exams or quizzes and the same individual's score on group portions. Although group rules are designed to encourage everyone to participate to the best of their abilities, they are usually not punitive enough to discourage people from not participating. Group members probably aren't comfortable with each other initially and are unwilling to set up harsh consequences because they don't want to imply that their fellow group members would slack off and also don't want to portray themselves as uptight and demanding to their fellow group members while everyone is still new to everyone else. If group evaluations were counted

for some portion of the grade, this problem might be avoided. I'm not sure if students are aware that there can be consequences for not contributing to the group, and some students may only respond to consequences that affect their grades. However, these students must still be pushed to participate because their groups rely on them.

- I think that it is really important to ensure that all group members are doing their part. It's hard to be confrontational in a group that you will be working with for an extended period of time.
- I enjoyed learning new material with the cooperation of my group members. Possible improvement could be having a few class discussions regarding unsolved learning issues.
- I think the way to improve it is to be somehow given the general topics of what should be learned for each article and the topics to be briefly gone over to make sure the concepts were learned.
- I think sometimes the course relied too heavily on the group. Because learning issues were essential in understanding important concepts, the collective minds of the entire group was needed to come up with all the issues that were needed to do well on a test or quiz. However, if one or two persons were not prepared, the group's ability to identify and solve issues were greatly hindered.
- The only thing I did not like about this course was the amount of time and effort put into it outside of the classroom. This was particularly difficult while spending much of my free time doing research in a lab and taking 12 other academic credits. However, the amount of time spent preparing for this course was worth it and allowed me to achieve a deeper understanding of chemistry and learning itself.
- I liked the information that we learned and I think that the focus on hemoglobin was a REALLY good idea-- for too many reasons to list. I initially did not like the learning through articles, but I think it got better and I realized that the articles were benefiting me more than reading a textbook would. Ways to improve would be: first, THERE ABSOLUTELY MUST BE A WAY TO SPEND AT LEAST A CLASS PERIOD BEFORE TESTS/AFTER TESTS GOING OVER THE MATERIAL-GET PEOPLE ON THE SAME PAGE! Things were sometimes just brushed over in hushed tones/moved on before people understood, information was forgotten, questions were never answered...it is important that the material be gone over and EXPLAINED-just for a day- NO QUESTIONS!. My group members were discussing an important concept that my tutor happened to be asked on a test last year when she took this class--after much debate over the explanation, we asked for clarification. Our tutor STILL didn't know the answer/why points were taken off/what the concept was. Clearly, this shows that certain individuals in the class are getting left behind and are not learning the material they should. Even if it seems everyone understands the material, there is probably someone sitting there too confused to ask only one question. This is why learning in this class has been so difficult/ a huge unnecessary frustration
- The class is very good for a problem based learning class. I personally don't learn very well in that environment but it is an extremely well set up class.

- More quizzes would be nice (I'm sure I'm the only one to say that) to ensure that we have an adequate understanding of the material to Prof. White's level of req. Have class be a bit longer (1:15 WMF would be nice), or add in a discussion section. Often it seems that group discussions are just getting rolling when oops time is up.
- I enjoyed this course. I am so much more confident in my learning abilities now as a result of taking the class. Dr. White is a great professor and the PBL-style of the class was interesting and effective. Definitely worthwhile.
- I liked the course, however, it is extremely agonizing when your group does not work efficiently (this happened to me for jigsaw groups). I understand that it is difficult to split the class, but my opinion would have been totally different if I had to do this evaluation with my jigsaw group as my home group. Also, I liked the encouragement to go to seminars, even though I didn't understand them.
- No improvements can be thought of at this time.

**Final Course and Instructor Evaluations**  
**CHEM-342 - Introduction to Biochemistry - Spring 2009**  
**Instructor: Harold B. White, III**

The following are the responses of all 20 registered students to the University of Delaware's on-line course evaluations conducted during the last week of classes.

**Instructor Evaluation**

| Question  | Strongly Disagree | Disagree | Neither | Agree | Strongly Agree | Total (20) | Mean | Std. Dev |
|---|-------------------|----------|---------|-------|----------------|------------|------|----------|
|   | 1                 | 2        | 3       | 4     | 5              |            |      |          |
| The instructor demonstrated thorough knowledge of the subject matter.                                   | 0                 | 1        | 0       | 1     | 18             | 20         | 4.8  | 0.70     |
| The instructor presented the materials in an interesting way.   | 0                 | 0        | 2       | 9     | 8              | 19         | 4.32 | 0.67     |
| The instructor encouraged class participation.  | 0                 | 0        | 0       | 3     | 17             | 20         | 4.85 | 0.37     |
| I would recommend this instructor because of his/her teaching to others considering taking this course. | 0                 | 1        | 2       | 5     | 12             | 20         | 4.4  | 0.88     |
| The instructor's lectures were well organized.  | 0                 | 1        | 6       | 7     | 6              | 20         | 3.9  | 0.91     |
| The instructor was helpful if you sought help outside of class. (Don't respond if you didn't.)          | 0                 | 0        | 0       | 3     | 14             | 17         | 4.82 | 0.39     |
| Overall, the instructor was effective in facilitating your learning of the material in this course.     | 0                 | 0        | 2       | 8     | 10             | 20         | 4.4  | 0.68     |
| Instead of group work, I think Dr. White should lecture more.   | 4                 | 6        | 4       | 2     | 4              | 20         | 2.8  | 1.44     |

**Essay Responses for CHEM-342 Section 10 for 2009 Spring****Instructor: Harold Bancroft White III,****Question ID: 3435 Comment on the instructor.**

Responses (15 of 20)

- Dr. White's PBL method forces his students to think outside the box and not just reiterate what is learned in lecture. I am now more confident and comfortable to learn on my own and to pursue learning without much instruction. I have found this class to be very beneficial, and in particular it has made me feel more confident as I begin undergraduate research this summer, where there is no longer a simple answer.

- Dr. White challenged all of us to learn ourselves rather than to depend on him for the answers. He guided our understanding rather than spoon-feeding facts.
- Presented class in a very interesting way. Thought way that each article was in chronological order made the increasingly more difficult articles easier to understand.
- Instructor was highly interested in the subject matter and obviously cared about the progress of the students. Problem Based Learning was unconventional but was a welcome change of pace. No lectures were given, but I feel that I learned a significant amount nonetheless.
- Interesting approach to facilitating learning. I enjoyed working in groups and thinking of questions I didn't think I could answer but eventually did.
- Professor White knew the subject matter very well. He is a very nice professor that is always willing to help.
- I feel that Dr. White's method of teaching is instrumental in learning the subject matter. I was initially skeptical about this manner of teaching, but after taking this course I feel this was the only way to truly learn the subject material. One can be lectured on hemoglobin or sickle cell anemia but the depth of understanding attained would not be the same as I have acquired from Dr. White's method of teaching.
- PBL is great but i feel that if my group wasn't so on top of things, we would of all suffered if one person wasn't prepared.
- Dr. White is a very knowledgeable professor that expects a very high level of participation and effort in his class. He effectively motivates students to learn on their own and to synthesize new and old material instead of simply understanding the material.
- very helpful
- Professor White is clearly knowledgeable about the topic and has much experience in teaching students. This pays great dividends in the class, and makes it much more enjoyable and make learning much easier
- Dr. White is a great professor. He really knows what he's talking about and wants nothing more than to see all of his students succeed. I really enjoyed the PBL structure of the class as well. It really changed my learning and study habits for the better.
- Professor White was very effective when he personally facilitated our group discussion and his demonstrations were helpful for understanding the material.
- Runs the class well.
- Very helpful.

**Question ID: 3609 Identify or describe some way(s) that Professor White could improve his teaching (and your learning).**

Responses (14 of 20)

- I feel that there is very little that Dr. White needs to improve. The whole point of the course is that Dr. White shifts the pressure off the teacher and puts learning into the students' hands. He therefore becomes more of a facilitator, which he performs well.
- The expectations on certain assignments could be more clear. This especially pertains to the concept maps and the final paper.
- More lectures. Thought that sometimes there was too much time for the groups to talk about the articles.
- Professor White could give students a few references that he believes to be particularly relevant or helpful to the problems presented in class as a starting point. The number of chemistry resources available to the student can be overwhelming, so a few basic, good references would be particularly useful. Otherwise, the setup of this class was conducive to learning.
- I think he should ensure that the students grasped the important concepts to each article. It is also important to ensure that each group member fulfills their responsibilities, possibly by checking in on them individually once a week for the first few weeks.
- I think I would've learned better if I had known beforehand the ideas/topics I was supposed to learn from each article. I was never sure if what I thought I learned from the articles was everything I was supposed to be learning, or even if I was understanding them correctly. I think instead of spending the last day of each article still in our groups, I think it would've helped to have Professor White touch on each of the concepts we were supposed to have learned in the article. We would still have had to figure them out based on the article, but at least we might've had more assurance as to what I was supposed to know.
- I feel that Dr. White is a highly skilled teacher for this type of material. He was extremely good about responding to emails and answering questions both to answer questions and also to explain why it was that way. The only thing I could think to change would be to possibly give a brief introduction to the main topics of the course before covering them with a brief explanation of each.
- i think a few more informational lectures would help.
- Dr. White has had years of practice teaching, perfecting, and improving this course. He teaches this course very well and accomplishes his goal. It was very difficult to maintain the level of dedication and focus required to be successful in this course.
- MORE ORGANIZATION, the information piles up on us in complete disarray which makes studying for tests PAINFUL; also, give us more direction, explain things some more, we can't

understand all of biochemistry ourselves if we don't even have some direction as to what we should be studying; the group idea has both positive and negative aspects. A major negative is that we all learn different information in different ways at different paces, do not combine knowledge together and then are expected to all take the same test! It's unfair

- Perhaps a bit more structure? Sometimes it feels as if PBL is almost too large of a portion of the class, and there isn't a lot of time for pulling the whole class together and making sure we are all on the same page/interfacing with each other. That is not to say that it needs lectures (see below), but that rather groups can get stuck in a rut too easily and there should be ore time to appeal to the wider class to discuss issues.
- Nothing! I was unsure about the class at first, but now I can see that I really did learn a lot from it.
- I think that Professor White could give a small lecture (not even a whole class period) at the end of each article, just to make sure everyone covered everything and put everyone on an equal playing field.
- A lot of the course is discussing the articles read previously. The only thing I would ask Dr. White to improve was helping the group acquire an understanding of the material faster. It sometimes takes a while to get certain points across.

**Question ID: 3608 Identify or describe some thing(s) that Professor White does particularly well.**

Responses (17 of 20)

- Dr. White forces his students to think instead of just reiterating facts. This is an extremely valuable skill, and in fact one of the main points of this course. This is something that most traditional courses miss, and Dr. White is very successful in making this happen.
- The PBL approach was very beneficial to me. I learned how to effectively learn, to read scientific articles, and to delve into issues. I was challenged to understand rather than to memorize. He helped facilitate my learning process
- The way the class is structured is great.
- A daily quote that sets the focus for the day's class is interesting and useful. Dr. White grades assignments quickly and returns them one class after they are turned in. His understanding of the course material seems to be vast, and he is extremely good at imparting his understanding without directly imparting knowledge. By doing this, he gives students the tools to learn on their own rather than rattling off facts for the student to memorize and possibly forget.

- He helped me ask complex questions that I didn't [know how to] ask in the beginning of the semester. (2) He keeps his expectations of his students high. (3) He taught us how to read scientific articles!
- Connects the class readings to each other to obtain a time-line of the study of hemoglobin and sickle-cell disease.
- Professor White answers questions really well, and admits to not knowing everything.
- Dr. White is highly experienced at making one think about not only the answer to the question but also the why. He doesn't just answer a question but will instead lead you to figuring out the answer yourself which is, I believe, a better method of teaching than most exhibit. He is also very good at making one learn how best to read scientific articles for both full comprehension and how to build on this knowledge base.
- Helping us find out the important topics and concepts without actually guiding us there allowing us to understand the articles on our own terms which facilitates later development as a student and scientist.
- Dr. White encourages students to learn on their own in and outside of class. At the same time, he requires and inspires people to engage in cooperative group learning to complement the individual research and learning done outside of the class. He is understanding of students' limitations, but encourages them to get past them.
- His intentions are good, especially his goal to have us understand the material, draw it out, instead of just memorizing the facts
- He is very good at teaching with problem based learning. There is no question that he is one of the best at being able to use this teaching style in the school.
- Just about everything in the class.
- He's very approachable. I unfortunately never sought his help outside of class, but I know that if I did he would definitely be willing to talk to me.
- The activities and demonstrations were the most effective methods of determining whether or not we understood the material.
- I like that he goes around and talks to the groups. The group work taught me how to work efficiently with others.
- Helping us to understand concepts. Showing what is occurring during some of the author's experiments.