The Weekly – Episode 3

Professor Chris Durr’s podcast for CHEM 161

Duration: 00:10:00

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Chris Durr:

Welcome back class to a new week of Chem, 161. This is the third episode of the weekly, and it will be covering week nine. So, I want going to start by saying thank you for your patience with us. As we move the course online, we know it's not perfect yet. We know it's not ideal for everybody, but we're doing everything we can. We know that you're doing the same, so we hope you're well. Thank you again for your patience. And I hope that there's weekly will give you some idea of where we're going this week, but I want to start with some announcements. The first one is about the colleges opening up the FGO option for all students. And so, what that means is that we will grade you just like we would, if there wasn't enough FGO option. And then at the end of the course, we'll tell you your grade and you have an option to take that grade or to take a pass.

So, keep that in mind. The one thing I'll say is that you should probably talk to your advisor about the FGO option, especially if you want to go to medical school, talk to your advisor, talk to the health care professions board and get their opinion on the FGO. If you're planning to be a chemistry major, there's going to be no problem. If you end up deciding to take a pass, we allow a pass grades for major requirements. And so there's no problem there. So, if you're confused or you're wondering, just, just reach out and talk to one of us about it.

The next announcement is a list of equations. Everybody's been asking about equations and what's going to be on the exam. And so there's a list of equations up now on the homework section. So, take a look at those and that will help guide your studying. So you know which equations are important, which ones are just steps within derivations. And so with respect to derivations, I've gotten a lot of questions about this, oftentimes about the isothermal expansion of a gas and people have been asking, you know, how detailed do I need to know the derivations? What's the point of the derivations? Am I going to need to know it on the exam? And here's my opinion on the derivations. It's important that you see the derivations. It's important that you read about them. You hear me do them, and it's important that you even try them on your own before you just dismiss them as impossible to do, because I really do think you can do it. It just takes some practice. It takes a different way of thinking about math. And so, we're not going to ask you to regurgitate a derivation on the exam. That wouldn't be a good use of anybody's time, but they're still important. It's still important to start thinking that way and thinking about how you can make new, useful equations from the equations that you already have. And it shows you how, especially in thermodynamics, all of these different concepts are intertwined. And so they are important to see. You don't need to know every single step. If you're confused by a particular step, reach out to us and we can help walk you through it.

The next thing I got on the one-minute papers almost to a person was can you do more examples? And, the answer is I'm going to try. It's to get that many examples down because it's taking me so long to make these lectures, but I'm going to try. So, this week I'm going to give you a couple bonus examples along with the examples that are in the lecture. But keep in mind, that is one reason why we gave you the homework so that you can see examples and you can work them and you can reach out for help if you're having trouble working through those. It's why we give you the sapling and there's plenty of resources online and in the book where you can do more and more examples.

Okay, with that, those were your announcements. Let's take a look at the week ahead. So, the first thing you should probably do is download the “What to Do When Checklist”. It's different from last week, and it will outline what you're doing on each day. It will outline where the homework is and when it's due. It will outline when the lab is due, discussion and so on. And so, make sure you pick that up and check off what you've done as you go along to help keep you organized.

A couple of changes this week: homework will be due April 5th at midnight. We’re giving you a little bit longer to do that and the same with the lab. So, the lab will be due April 5th at midnight, as well, submitted through Grade Scope. With respect to the lab, you're going to be working on the calorimetry lab this week. So, if you have the data, great, so we can work that up and submit it at the end of the week, the pre-lab and the post-lab. And if you haven't done it, the data is going to be up online for you to work through, to turn it [audio glitch], make sure if you have questions, you check out the lab forums or any of the forums. If you have a question on the homework, lecture, logistics, whatever it is.

So, lectures this week, we're going to be talking about Gibbs free energy, a term that some of you might remember if you're in 191, there's a good chance that you've heard about Gibbs energy already. We're going to really dig into what it is and Gibbs is a really important concept for this class and for other classes. And that's because it's a culmination of all these thermodynamic processes and Gibbs is a really important concept. We're going to be using it for the remainder of this section. We're going to be using it in electric chemistry. We're going to be using it when you get to organic chemistry. So you'll use it all the time there and in biochemistry. So it's really useful because it brings together all these different thermodynamic terms. It really makes for applications broadly defined.

Make sure you're doing the reading ahead of time and come to the lecture prepared. We'll give you some examples. We'll give you some problems to work in sapling and on your homework. Discussion this week will be just like discussion last week. We hope that it was good for you all to see each other and to see us. And don't think that's the only time you can see each other. If you want to set up different Zoom calls, I'd encourage you to do that. Set up Zoom conversations with your friends, go through the homework, go through whatever it is you need to do to try and connect in that way. But we'll definitely be coming back together on Friday for another discussion, but we'll get to put again into practice some of these thermodynamic ideas.

And lastly office hours, make sure you look for office hours up on Moodle. We'll put the Zoom link right there, so you can connect with us and ask us questions. And if you have questions in the meantime, you can always pop them into the forum and we'll get to them eventually.

So, with that, that brings us to our chemist of the week. Weeknights chemist of the week is Rosalind Franklin. Rosalind Franklin was born July 25th, 1920, and Notting Hill, London. Franklin studied chemistry at Newnham College in Cambridge and was awarded a research fellowship to pursue her PhD in 1941. But she gave that up to work for the British Coal Utilization Research Association, an association that was looking into different ways that the British and the Allies could use coal to help advance the war effort. It ended up working out though because she had used this research for a doctoral thesis and eventually received her doctorate from Cambridge in 1945. Now Dr. Franklin spent several years in Paris working for Jacques Mering and studying x-ray diffraction, a technique that would go on to really change her career and the world, as we know it, because in 1951, she joined the Biophysical Laboratory at Kings College where she was applying this x-ray diffraction method, that she had learned in Paris, to the study of DNA.

Her work on DNA led the conclusion that DNA was made up of two intertwined helices and you can still see the famous photo today of that X shaped x-ray diffraction pattern that helped prove that that was the structure. And that finding would be pivotal to Watson and Crick model of DNA that they would go on to publish in 1953 in *Nature*. But Franklin's contributions to this discovery were not directly acknowledged in that paper. And it was some time before people started to fully give her the credit that was due to her for helping elucidate this model that would change biology and life, really, as we know it.

After completing her work on DNA, she moved on to study the molecular structure of tobacco mosaic virus, and she collaborated on studies showing that RNA and viruses was embedded into the proteins rather than in a central cavity. And that RNA was a single-stranded helix, unlike DNA. What's incredible is that she did all of this paradigm changing science before the age of 37, where she tragically died of ovarian cancer. And while she died so young, the legacy she left behind in the field of chemistry and molecular biology is truly incredible. And there you have it. Your chemist of the week is Dr. Rosalind Franklin. I want to thank you all for listening. I wish you good luck this week in this class. And every other class that you're in. If you have any questions, please let us know. We'd be happy to hear from you.

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