



TechTrendsetter Highlight

- Dr. Derek Cashman
- Dr. Stacy Brown
- Dr. Evan Hart

Agenda

Introductions

TechTrendsetters:

Q & A

Dr. Derek
Cashman

Dr. Stacy Brown

Dr. Evan Hart



Dr. Derek Cashman

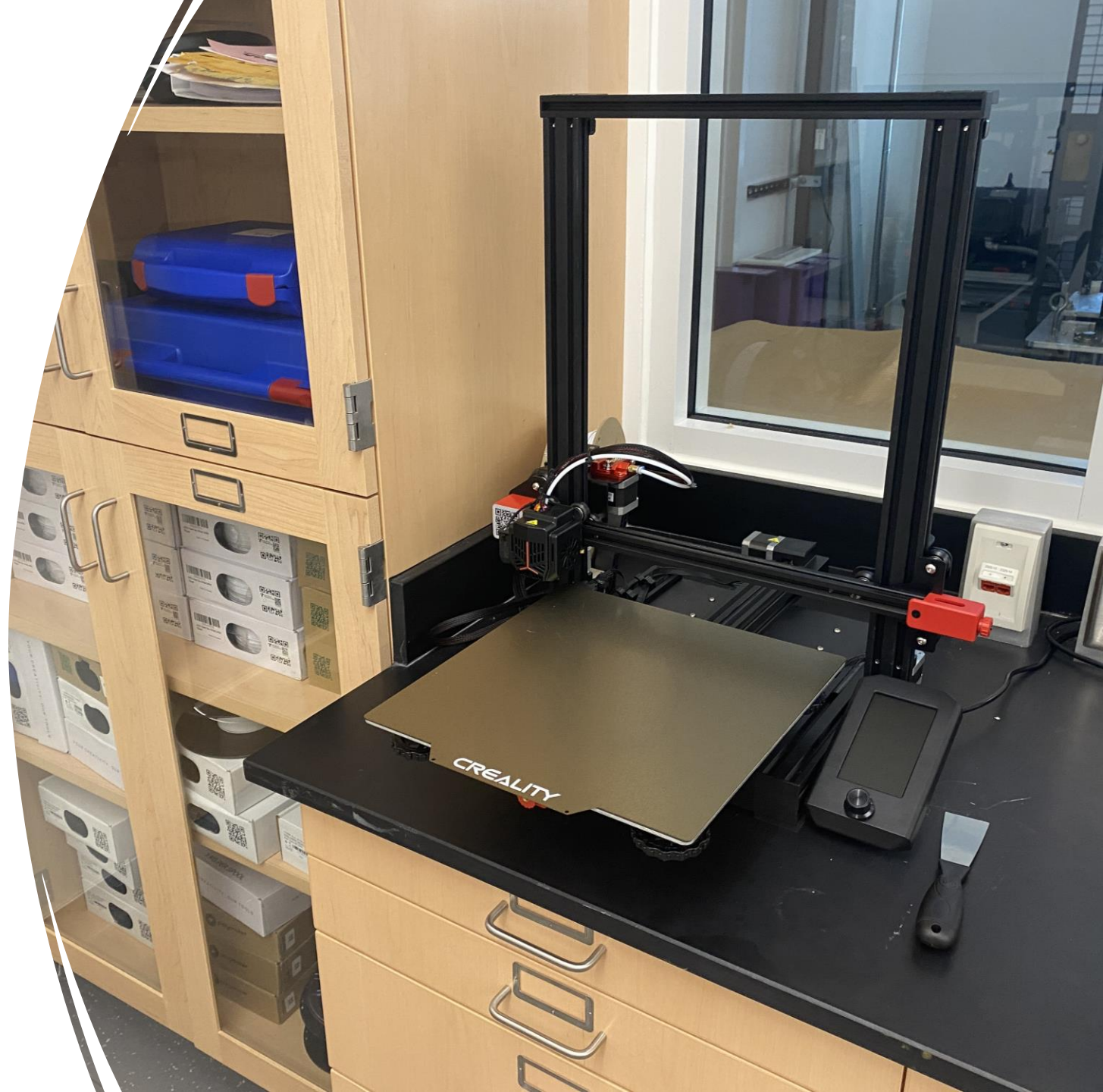
Chemistry
College of Arts & Sciences

Topics

- Course Design in CHEM 4620
- Learning objectives
- Molecular Modeling Tutorials
- 3D printing
- Takeaways from OLC

Course Design in CHEM 4620

- CHEM 4620: 1 section, in-person with online homework
- Technology:
 - Online activities for molecular modeling were developed using Chimera X and video tutorials were produced as an instructional guide for molecular modeling.
 - Students used 3D printing technology to produce hands-on models of substrates of biochemistry pathways for study.



Learning Objectives

- Through the OLC course, the learning objectives of CHEM 4620 were revised and expanded to include specific objectives based on Bloom's Taxonomy.
- Seven learning objectives were written and introduced in the course. Three of them focused on the 3D modeling activities and 3D printing:
 1. To understand and recognize how the structure of a biological macromolecule is related to its function by investigating how the 3D structure of an enzyme is found by constructing a model using artificial intelligence technology.

Learning Objectives

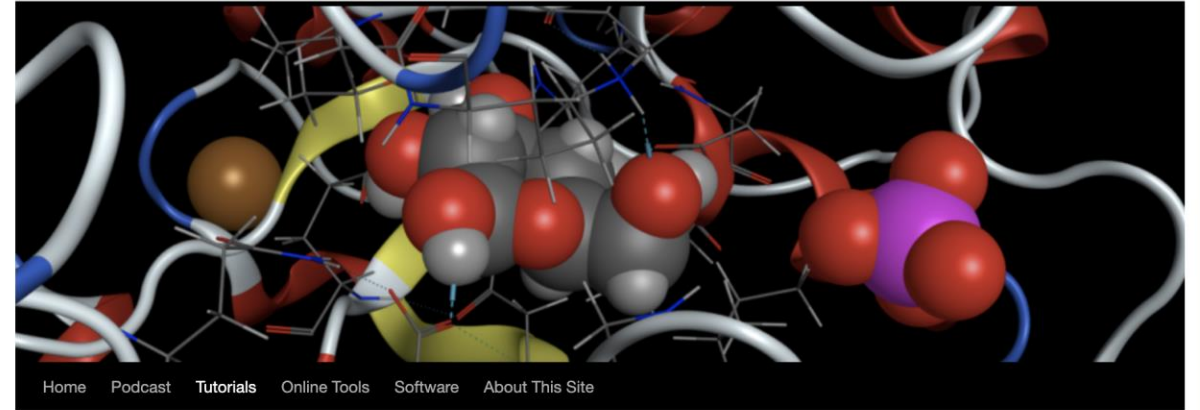
- Seven learning objectives were written and introduced in the course. Three of them focused on the 3D modeling activities and 3D printing:
 2. To learn the importance of the use 3D visualization software to interpret 3D biological data and to construct a model of an enzyme given only sequence data.
 3. To recognize and describe the metabolic pathways involved in the conversion of carbohydrates, lipids and proteins to energy sources utilized by living cells and investigate how the 3D structure is important in this process through the construction of 3D printed models.

Molecular Modeling Tutorials

- A website was developed containing written and video tutorials for students to use as a guide in learning molecular modeling techniques as well as the use of AI for 3D modeling of proteins and biomolecules.
- [Link to Website](#)

Biochemistry Unfolded

From Atoms to Algorithms



Tutorials

- [Analyzing the Structure of Cytochrome C](#)
- [Debugging Gaussian and UNIX Errors | Fix Segmentation Faults, Input Issues and More!](#)
- [How to Create a Gaussian Input File for QM Calculations in Parallel on Ubuntu](#)
- [Protein Structure Visualization and Analysis Using Chimera X](#)
- [Molecular Modeling of \$\beta\$ -Fructofuranosidase](#)
- [SMILES Tutorial](#)
- [Using AlphaFold2 with ChimeraX to Predict the Structure of Cytochrome C](#)

Recent Posts

- [Welcome to Biochemistry Unfolded!](#)

Recent Comments

No comments to show.

Archives

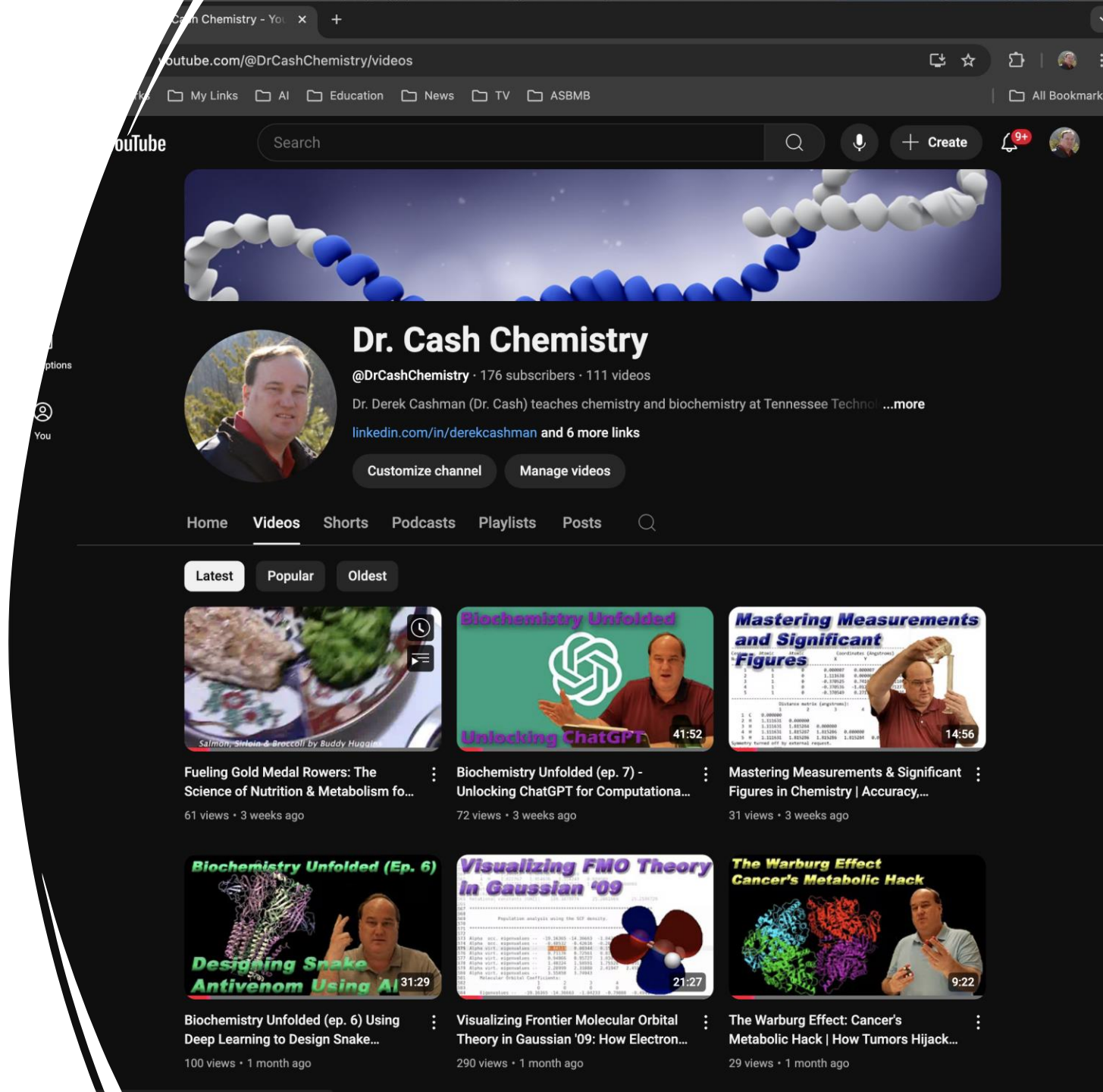
- [September 2024](#)

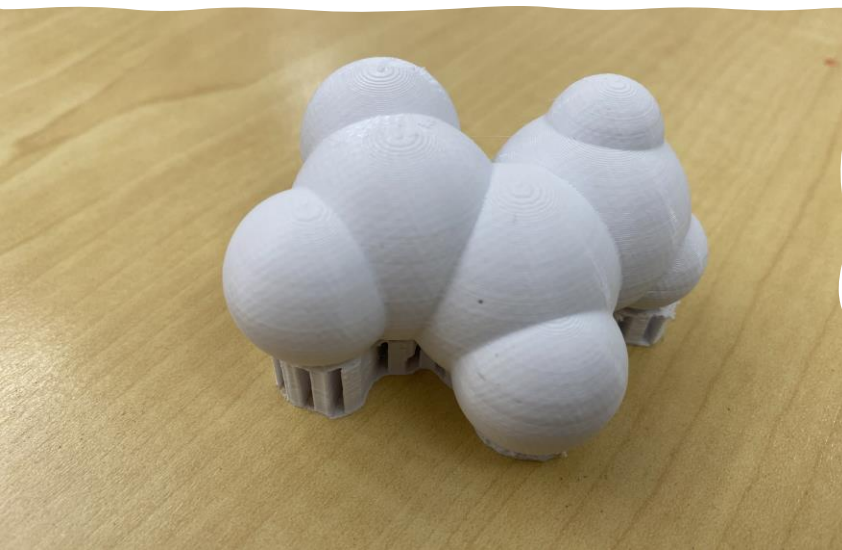
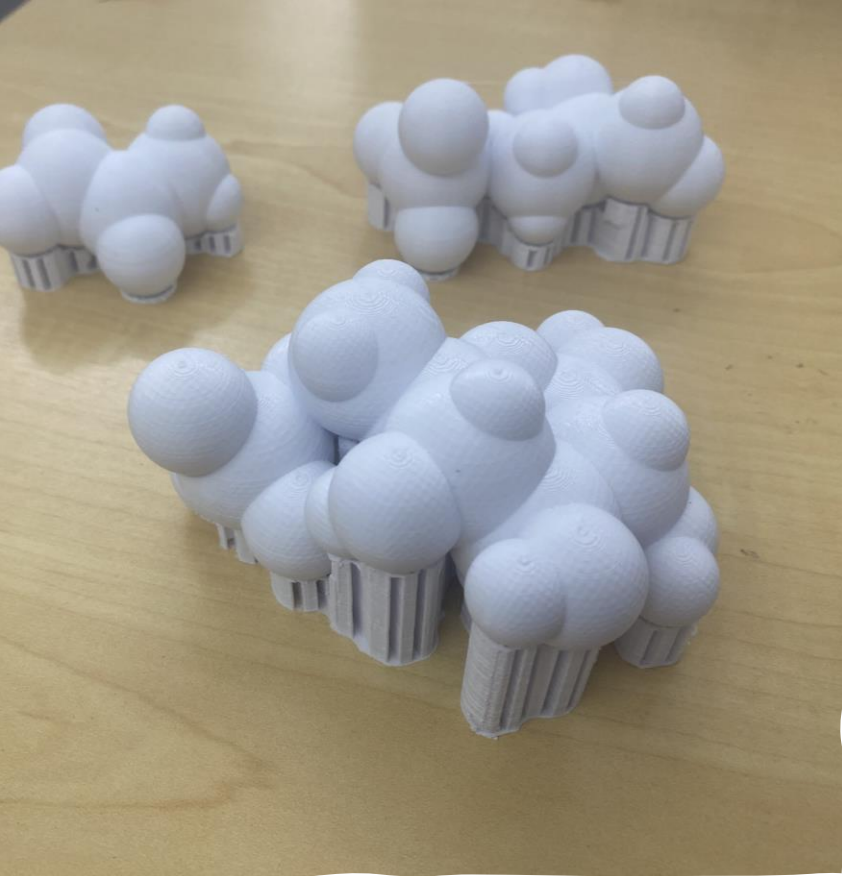
Categories

- [Uncategorized](#)

YouTube Channel

- The video tutorials are hosted on my YouTube channel for easy access, even outside of Tennessee Tech.
- Link to YouTube: [Dr. Cash Chemistry](#)
- Since Fall, this channel has now grown to include tutorial and instructional videos for my spring classes as well.





3D Printing

- 3D printing was used to instruct students with a hands-on activity designed to familiarize them with the size and shape of substrates of glycolysis and the citric acid cycle.
- Software used for this activity includes MOE 2024, Autodesk Fusion, and UltiMaker Cura.
- In addition to the 3D printing activity, several questions were provided in the assignment focusing on the application of each molecule in metabolism.

Takeaways From OLC

Three Electives were taken as a part of the OLC certificate in online teaching:

1. ADA & Digital Accessibility
2. AI Course Design
3. Podcasting for Teaching and Learning

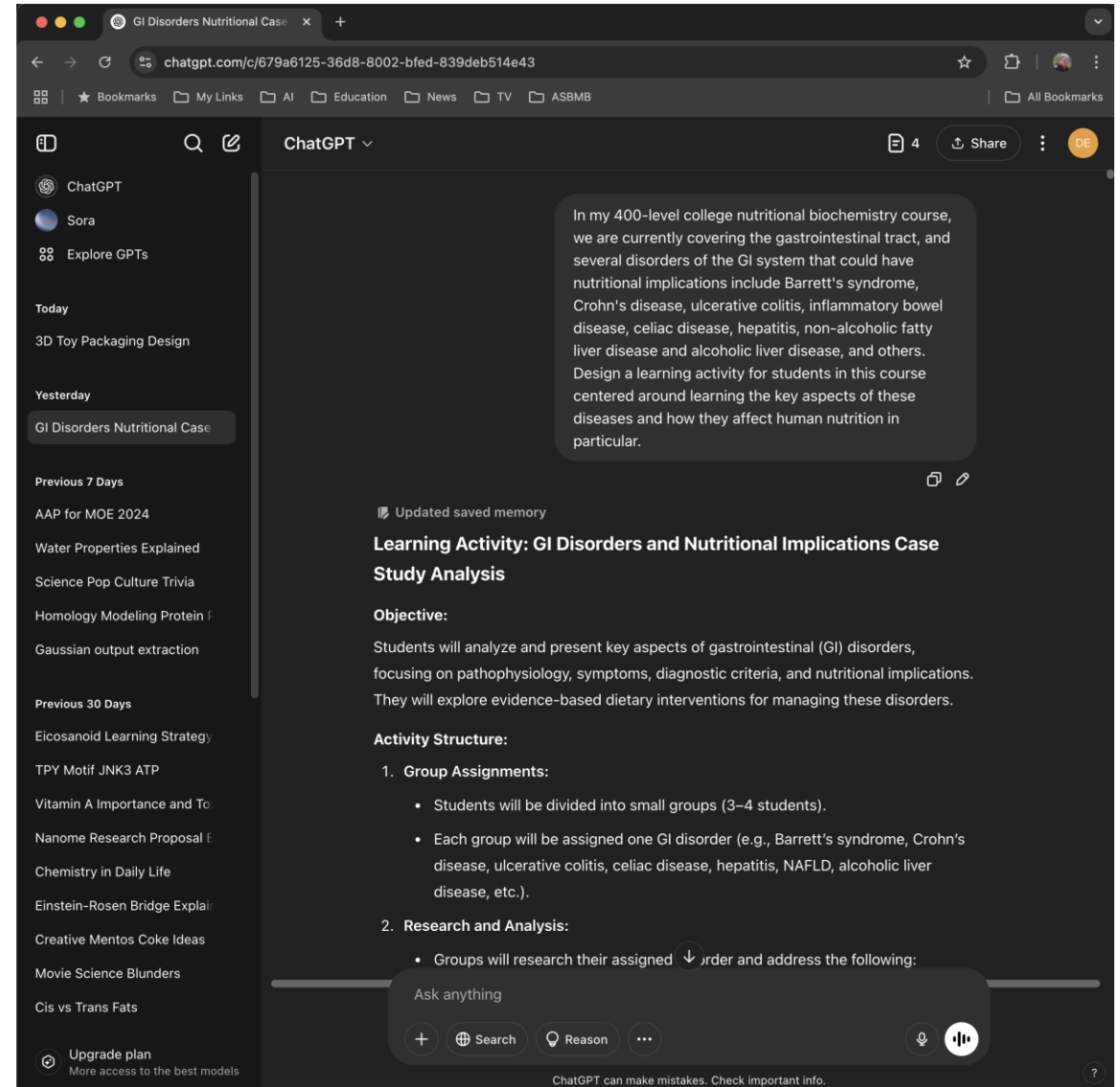
OLC Elective: ADA & Digital Accessibility

- The ADA & Digital Accessibility workshop was very helpful in instructing about all aspects of accessible course design.
- One key takeaway was the screen reader simulation.
- The second major takeaway was the focus on universal accessibility focusing on ensuring access for everyone, not just individuals with specific disabilities.

The screenshot shows the eLearn LMS interface for the course CHEM 4620 (001): General Biochemistry II. The browser address bar shows the URL: elearn.tntech.edu/d2/lle/content/9830415/Home. The course title is displayed in the header. The navigation menu includes: Content, Assignments, Quizzes, Discussions, YuJa Media, Grades, Course Tools, Resources, and Course Management. The main content area is titled "Module 0: Start Here" and includes a search bar, a "Print" button, and a "Settings" button. Below the title, there is a large purple banner with the text "Module 0 WELCOME & GETTING STARTED" and the Tennessee Tech logo. To the right of the banner, there are buttons for "Upload / Create", "Existing Activities", and "Bulk Edit". Below the banner, there is a section titled "Course & Instructor Information" which contains a message: "Here is some information about your course and your instructor. Notice also that the link to the printable syllabus is on the top left of your screen." Below this message, there are three items listed: "Course Welcome & Introduction" (Web Page), "Course Learning Objectives" (Web Page), and "Meet Your Instructor" (Web Page). Each item has a checkmark next to it. On the left side of the interface, there is a sidebar with a "Search Topics" bar and a list of course topics: Course Syllabus, Bookmarks, Course Schedule, Table of Contents (119), Final Exam (1), Module 0: Start Here (15), Course & Instructor Information (9), Student Policies, Student Services, & Technical Supports (6), Module 1 (9), Module 2 (11), Module 3 (19), Module 4 (13), and Module 5 (11).

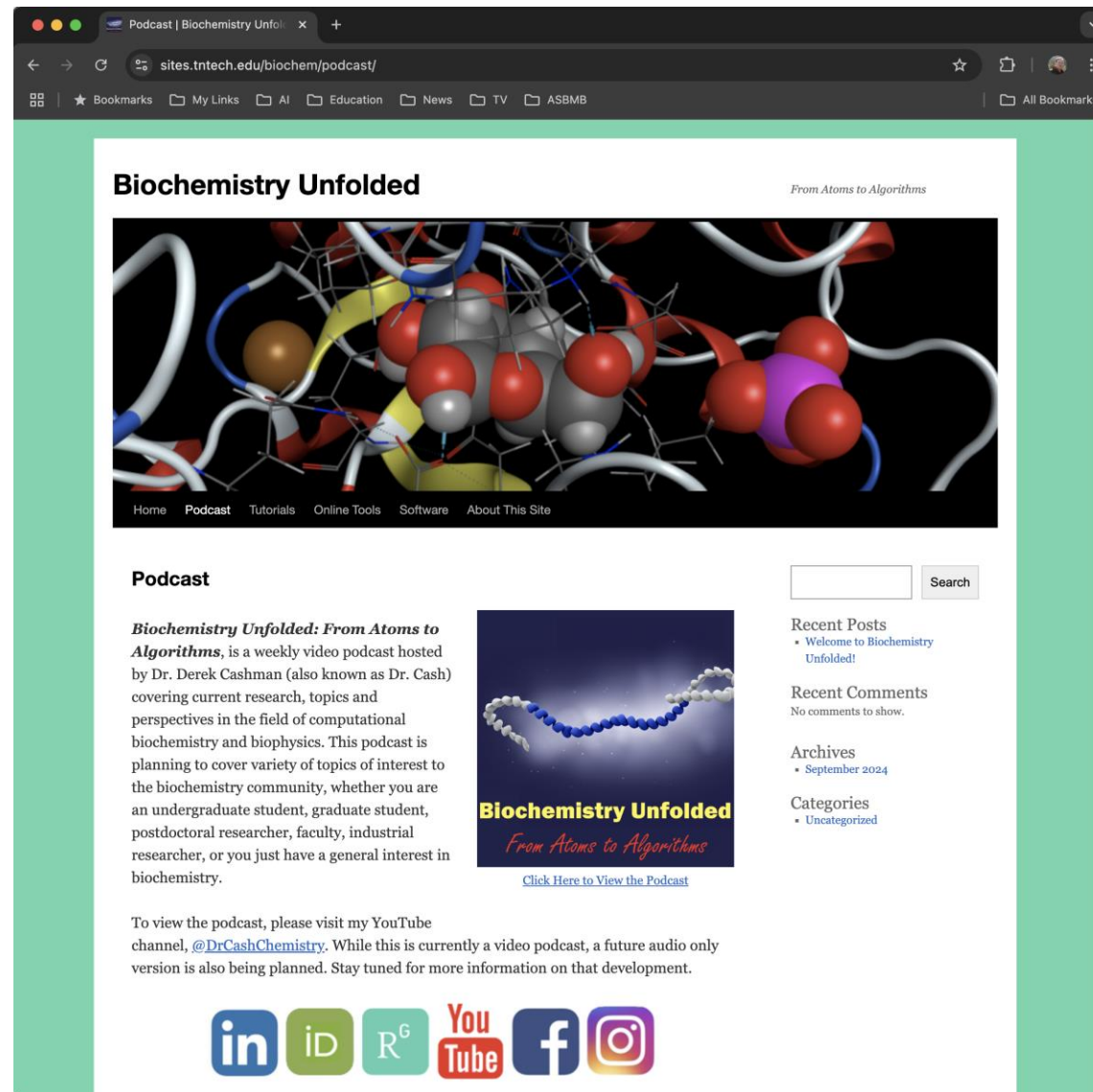
OLC Elective: AI Course Design

- The AI course design elective taught how to provide AI tools such as ChatGPT with effective prompts to design course materials, exam questions and other useful information.
- I also learned how to develop effective rubrics to be used for evaluating course projects and assignments.



OLC Elective: Podcasting for Teaching

- The elective on Podcasting for Teaching & Learning covered all of the aspects of designing and executing a podcast covering educational content.
- This included the technical aspects of proper equipment, and also the importance of developing a script.
- I used this information to develop a video podcast hosted on my YouTube channel: ***Biochemistry Unfolded: From Atoms to Algorithms.***



The screenshot shows a web browser displaying the website "Biochemistry Unfolded" at the URL sites.tntech.edu/biochem/podcast/. The website has a green header and a dark blue banner image featuring a 3D molecular model of a protein structure. Below the banner is a navigation menu with links: Home, Podcast, Tutorials, Online Tools, Software, and About This Site.

The main content area is titled "Podcast" and contains the following text:

Biochemistry Unfolded: From Atoms to Algorithms, is a weekly video podcast hosted by Dr. Derek Cashman (also known as Dr. Cash) covering current research, topics and perspectives in the field of computational biochemistry and biophysics. This podcast is planning to cover variety of topics of interest to the biochemistry community, whether you are an undergraduate student, graduate student, postdoctoral researcher, faculty, industrial researcher, or you just have a general interest in biochemistry.

To view the podcast, please visit my YouTube channel, [@DrCashChemistry](#). While this is currently a video podcast, a future audio only version is also being planned. Stay tuned for more information on that development.

At the bottom of the page, there are social media icons for LinkedIn, iD, R⁶, YouTube, Facebook, and Instagram.

On the right side of the page, there is a search bar and three sections:

- Recent Posts**: [Welcome to Biochemistry Unfolded!](#)
- Recent Comments**: No comments to show.
- Archives**: [September 2024](#)
- Categories**: [Uncategorized](#)

Reflections

- Through the completion of these modules and electives in online teaching, I modified the course learning objectives and activities in my General Biochemistry course to enhance the education of molecular modeling tools and artificial intelligence software.
- The additional molecular modeling activities reinforce a key concept of biochemistry – that the structure of a molecule or protein is critical in determining its function.
- The methods developed through the TrendSetter's grant have been used this spring to develop additional tutorials and activities for my spring classes.



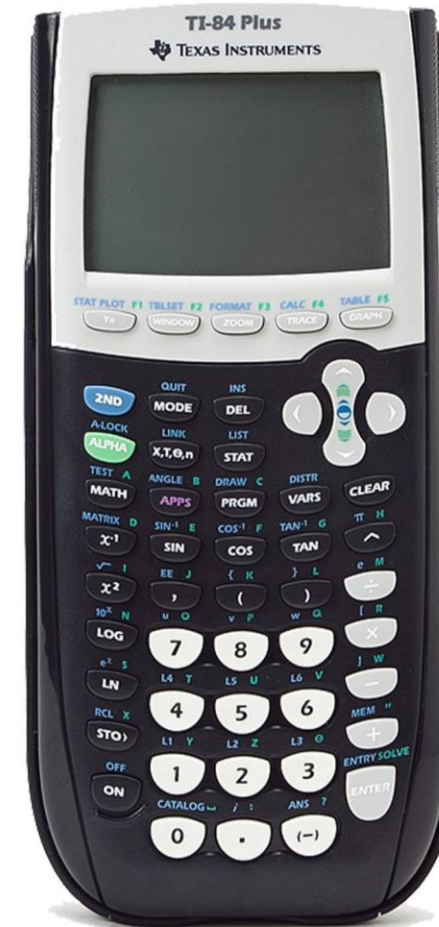
Dr. Stacy Brown

Math

College of Arts & Sciences

Overview

- Math 1530: 2 sections, online and in-person
- Technology: Class set of TI 84 Calculators
 - An informal survey of my Spring 2024 course showed only about 25% have access to this technology with cost being the primary deterrent.
 - Because of the TrendSetter grant, all students in my Fall 2024 MATH 1530 had access to the required calculator



OLC Takeaways



Students need frequent and effective communication from their instructor. Video communication and feedback can be invaluable.



Establish clear expectations early in the course



Accessibility! Closed captioning in videos, descriptive alt text, and color contrast in my design style.

Course Navigation

- Worked with CITL to implement a Tech Course Template in iLearn, based on OLC rubric for best practices in online learning.
- 8 modules, with consistent use of 3 submodules (Learning Materials, Module Debrief, and Homework)

The screenshot displays the iLearn course navigation interface for MATH 1530 - Introductory Statistics. The top navigation bar includes links for Content, Assignments, Quizzes, Discussions, YuJa Media, Grades, Course Tools, and Resources. A search bar is located on the left. The main content area is titled "Table of Contents" and features a "Download" button and a progress bar indicating 20.51% completion (16 of 78 topics). The left sidebar lists the course structure, including Module 0: Start Here and Modules 1 through 8. The right sidebar shows the "Module 0: Start Here" section, which includes a "Support Forum" link, "Course & Instructor Information", and "Student Policies, Student Services, & Technical Supports". The bottom section shows the "Module 1: Intro to Statistical Terminology" section.

MATH 1530 - Introductory Statistics (...)

Content Assignments Quizzes Discussions YuJa Media Grades Course Tools Resources

Search Topics

Course Syllabus

Bookmarks

Course Schedule

Table of Contents

Download

Expand All Collapse All

20.51 % 16 of 78 topics complete

Table of Contents 62

Module 0: Start Here 6

Module 1: Intro to Statistical Terminology 4

Module 2: Visual Representation of Data 7

Module 3: Descriptive Statistics 11

Module 4: Probability 6

Module 5: Discrete Probability Distributions 8

Module 6: Normal Distribution 7

Module 7: Confidence Intervals 6

Module 8: Hypothesis Tests 7

Module 0: Start Here

MATH 1530-500 STATISTICS

Module 0 START HERE

Tennessee TECH

Support Forum

Discussion Topic

Updated

Course & Instructor Information

Below you will find information about your course and your instructor. Please note that the link to the printable syllabus is on the top left of your screen.

Student Policies, Student Services, & Technical Supports

Here are some academic and support information listed in alphabetical order.

Module 1: Intro to Statistical Terminology

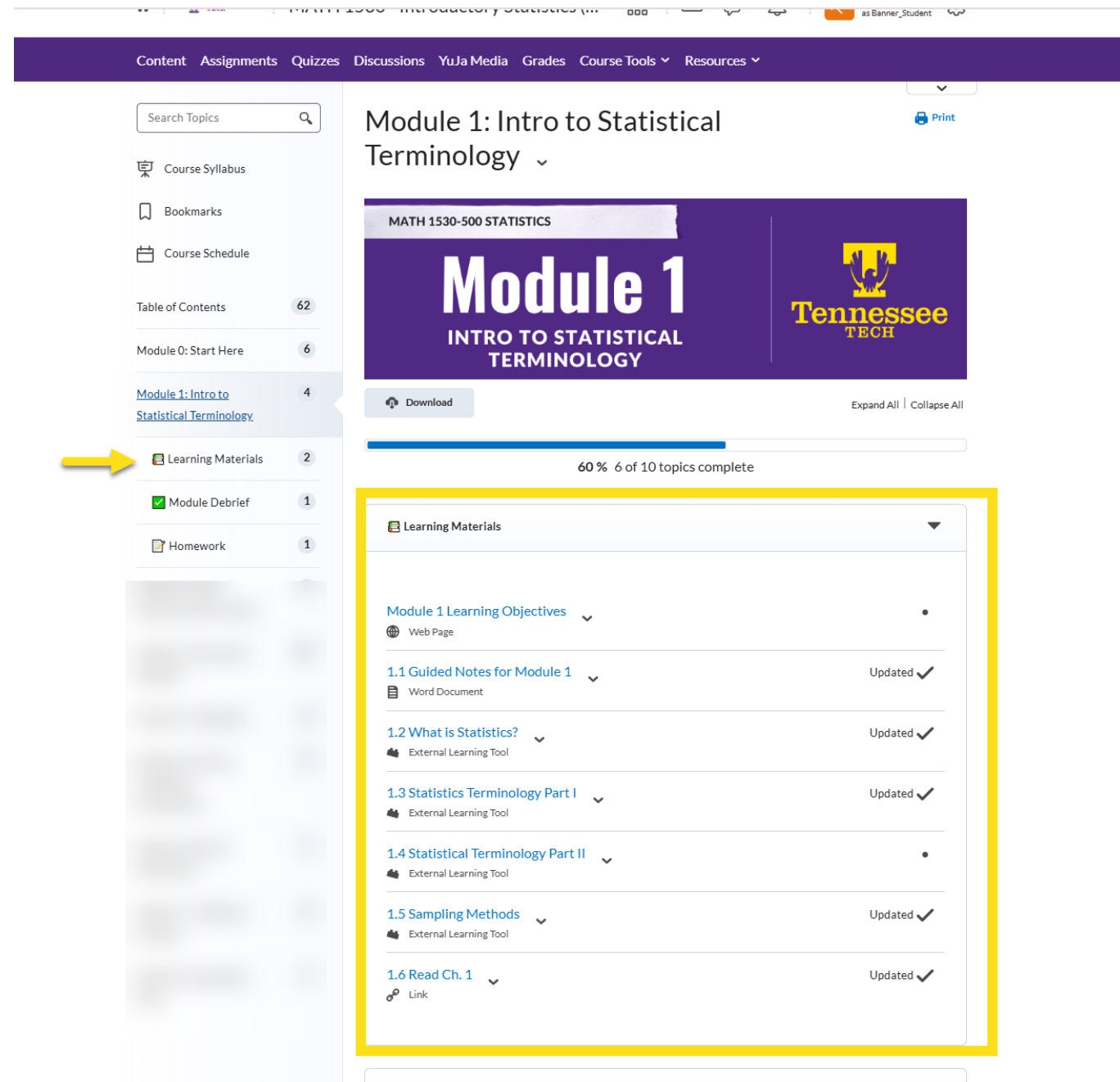
MATH 1530-500 STATISTICS

Module 1 INTRO TO STATISTICAL

Tennessee TECH

Course Organization

- The learning objective for each module is published within that module and all activities and assessments within this module support this objective.
- I included more frequent low stakes formative assessments in course, utilizing YuJa Playback Quizzes.
- Each module in my course has multiple low stakes assessments. For example, each module has lecture playback quizzes, check in quizzes and homework.
- These will be monitored and reviewed by me to remediate instruction if necessary.



The screenshot displays a Blackboard course interface for 'MATH 1530-500 STATISTICS'. The top navigation bar includes links for Content, Assignments, Quizzes, Discussions, YuJa Media, Grades, Course Tools, and Resources. The sidebar on the left contains a search bar and a list of course navigation items: Course Syllabus, Bookmarks, Course Schedule, Table of Contents (62 items), Module 0: Start Here (6 items), and Module 1: Intro to Statistical Terminology (4 items). A yellow arrow points to the 'Module 1: Intro to Statistical Terminology' link. The main content area shows the module title and a progress bar indicating 60% completion (6 of 10 topics complete). Below the progress bar, a yellow box highlights the 'Learning Materials' section, which lists various resources including 'Module 1 Learning Objectives', '1.1 Guided Notes for Module 1', '1.2 What is Statistics?', '1.3 Statistics Terminology Part I', '1.4 Statistical Terminology Part II', '1.5 Sampling Methods', and '1.6 Read Ch. 1'. Each item has a status indicator (e.g., 'Updated' with a checkmark or a dot).

Module Debrief

- To personalize the learning for students, I included a Debrief sub-module where I work through the problems that they request in a YuJa video.
- The Module Check-in helps facilitate just-in-time instruction or help for students before they move on to the next module.

MATH 1530 - Introductory Statistics (...)

Content Assignments Quizzes Discussions YuJa Media Grades Course Tools Resources

Search Topics

Course Syllabus

Bookmarks

Course Schedule

Table of Contents 62

Module 0: Start Here 6

Module 1: Intro to Statistical Terminology 4

Learning Materials 2

Module Debrief 1

Homework 1

Module Debrief

50% 1 of 2 topics complete

Module 1 Debrief

Link

This video summarizes important concepts from the module.

Module 1 Check-in

Quiz

Students,

Please answer the following questions about your learning in this module.

- _____

Support Forum

- The Support Forum, located in Module 0, was widely used by students.
- I moderated and answered questions, but students also interacted and helped each other.
- Going forward, I'm going to include this forum within the modules, based on student feedback from MID.

The screenshot shows the MATH-1530-500 - Introductory Statistics course page. The top navigation bar includes links for Content, Assignments, Quizzes, Discussions, YuJa Media, Grades, Course Tools, Resources, and Course Management. The main content area is titled "Support Forum" and contains a welcome message and a "Start a New Thread" button. Below this, there are three discussion threads, each with a title, a brief description, and statistics for unread posts, replies, and views. The threads are titled "Homework", "Homework #7", and "Homework 8 problem 3".

MATH-1530-500 - Introductory Statistics

Content Assignments Quizzes Discussions YuJa Media Grades Course Tools Resources Course Management

Table of Contents > Module 0: Start Here > Support Forum

Support Forum

Hello, [User Name]

Please use this discussion post to ask any course related questions you may have as you navigate through your modules. Also, if you see a question, you can help with, please feel free to do so. I will check in periodically to make sure that help is given, but the primary focus of this discussion post is for your class to have a place to give and receive help as needed.

[Start a New Thread](#)

Filter by: [All Threads](#)

Sort by: [Most Recent Activity](#)

Homework

[User Name] d Apr 2, 2025 2:35 PM [Subscribe](#)

I thought it was messed up before spring break and would be corrected but I'm curious to know why all my homework says it's due on 5/2/25? Very confusing for

[more](#)

0 1 5
Unread Replies Views

Last post Sat at 9:55 PM

Homework #7

[User Name] v posted Apr 1, 2025 7:01 PM [Subscribe](#)

Is anyone else having problems with homework #7? Questions 3 and 4 specifically, I am answering correctly; however, it says it's incorrect, even though

[more](#)

1 1 5
Unread Replies Views

Last post April 2 at 8:03

Homework 8 problem 3

[User Name] posted Mar 31, 2025 8:08 PM [Subscribe](#)

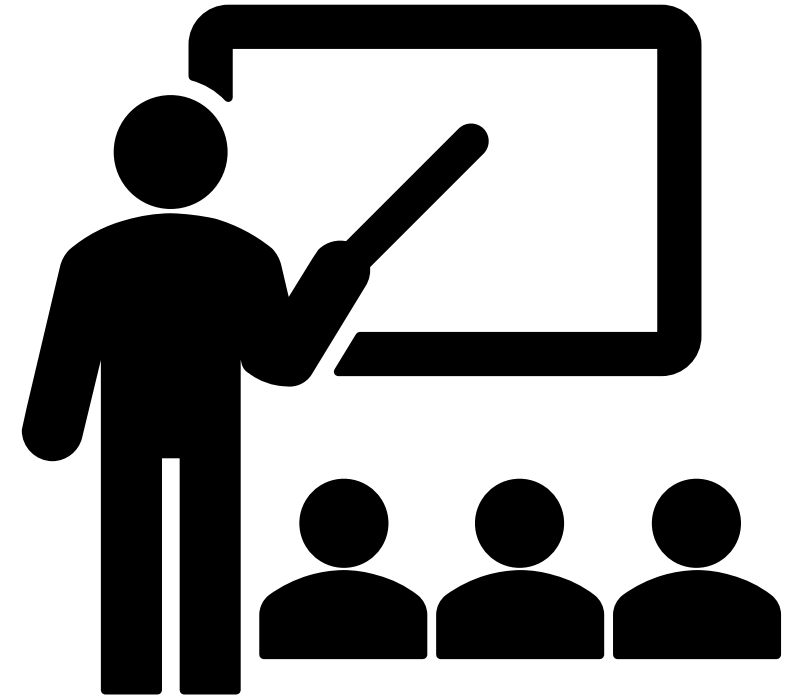
You measure 49 textbooks' weights, and find they have a mean weight of 69 ounces. Assume the population standard deviation is 7.7 ounces. Based on this,

[more](#)

0 0 2
Unread Replies Views

Next Steps

During the summer, I plan on further enhancing the course for a blended option of Math 1530.





Dr. Evan Hart

Geology
College of Arts & Sciences

Geology 3200 Grant Overview



Elective 1: Infographics

Key learning points:

- History of Infographics
- Accessible infographics
- Teaching with infographics
- GEOL 1045 course has component where students make their own infographic, share and comment on them
- I have also designed infographic to go in my lectures

Monteith and Priestley X TechExpress X My Meetings - Zoom X Module 0: Start Here - GEO X Google Maps X Quality Studio Final Presentat X Top

olc.instructure.com/courses/1247/discussion_topics/16337

Quality Studio Final... USGS landslide eve... Vexcel Gray Sky Ima... ChatGPT BBF Knowville's Greatest... GitHub - collinsowu... Landscapes




Evan Hart
Sep 15, 2024 10:08pm | Last edited Sep 15, 2024 10:17pm
[View History](#)

For my infographic, I designed a student assignment and the infographic gives students instructions on how to complete the assignment. The infographic also pro they collect in the field on a graph and a photograph. The goal is to visualize the flood height and allow the students to work with real world data in a interactive format but I have saved it as JPEG for ease of viewing here.

There are no copyright issues because the photographs are my own. The chart is sourced from NOAA.

Student Instructions:

- monitor rainfall gauges and collect data with *Bluetooth enabled device*
- enter the precipitation depth and duration in the chart below to find the *recurrence inter*
- match the recurrence interval with the elevation of flooding found on field trip (see phot

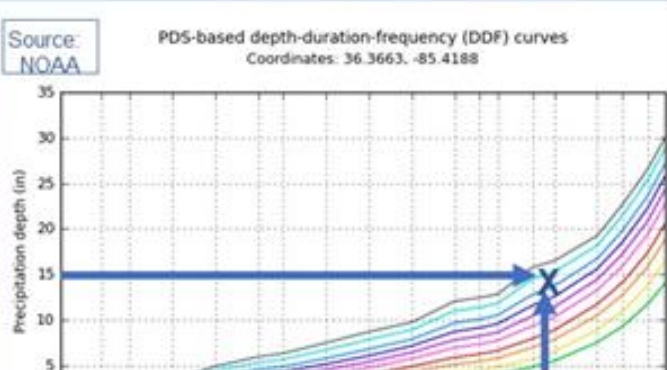


Approximate flood height
Blackburn Fork Canyon
8/18/2010

8/18/2010

Source: NOAA

PDS-based depth-duration-frequency (DDF) curves
Coordinates: 36.3663, -85.4188



◀ Previous

here to search

zm

Elective 2:

YouTube for Teaching

Key learning points:

- Playlists
- Making a YouTube Channel
- Adding text to your videos
- GEOL 1045 course has component where students make their own YouTube Video and share it with classmates and discuss

AYS 4 - 5 RESOURCES: YouTube Studio & Uploading Your Content



YouTube Studio & Uploading Your Content

Days 4-5 Resources

Accessing & Navigating YouTube Studio

Once you complete recording your video, you will want to upload it to YouTube into your channel. If the recording platform integrates with YouTube, you can use that bridge or manually upload it to YouTube Studio. Video tutorials below demonstrate how to access YouTube Studio and upload your video. Step-by-step text instructions are also provided in the link below the video.



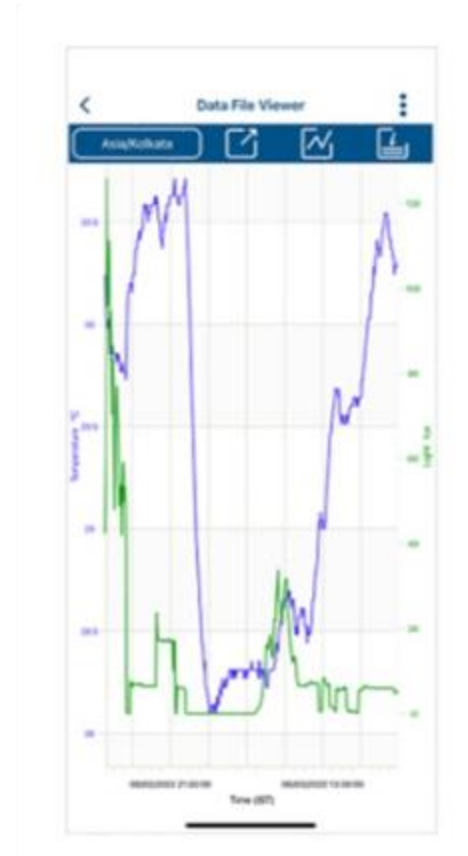
Note: Click on the CC icon in the bottom right corner to enable closed captions.

Uploading Videos with YouTube Studio





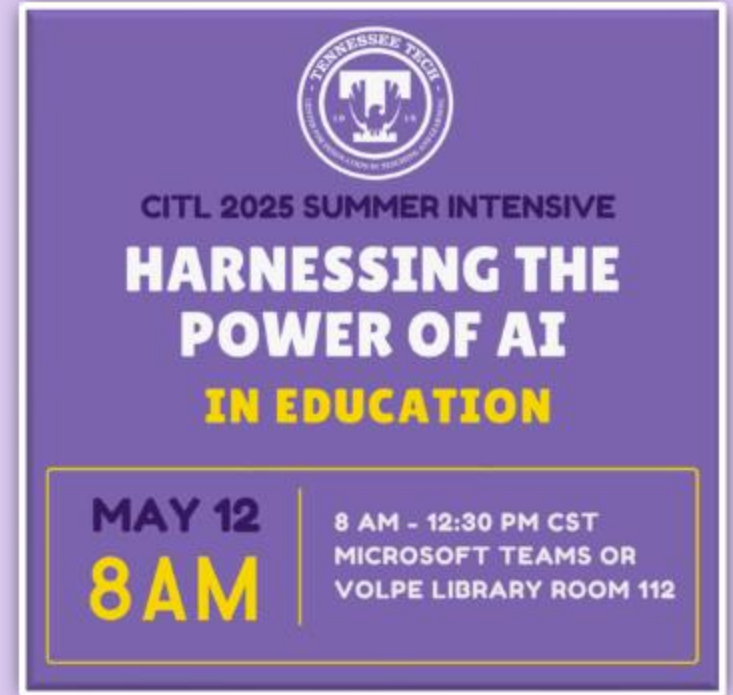
**Technology: GEOL 3200—
Bluetooth logger installed in TTU pond**



Technology: GEOL 3200—students access pond level, temp, and conductivity data from their device

Thank you!

- **Feedback Survey**
- **iLearn (D2L) Pulse Survey**
- **CITL Summer Intensive Registration**



Next Week's Session: Unlocking the Power of Copilot - A Beginner's Guide to Generative AI
[Register](#)