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Discussing the Role of the Instructor and the Instructional designer in a Fully Asynchronous Statistics Course

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*USCOTS 2023 Breakout Session*

# **Discussing the Role of the Instructor and the Instructional designer in a Fully Asynchronous Statistics Course**

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June, 2023

<https://www.escholarship.org>



# Session Goals

During this breakout session, we will

- Discuss the differences between an asynchronous course and an in-person course
- Introduce the role of an instructional designer in the partnership instructor - designer.
- Experience a fully asynchronous course as a student, instructor and instructional designer
- Exchange insights on DEI and accessibility via the interactive activities
- Discuss how an online course is designed and built in a LMS (Canvas)



# Engage With the Activities in This Breakout Session Using Different Methods

A demo course site in Canvas

- Entering the Canvas Learning Management system for a sample of what we talk about.
- Interacting with the course site after our prompts while you follow the slides.
- Gather Town experience

Presentation slides

- Accessing the slides that we are using for the presentation and easily clicking on links we provide from there. Access slides at <https://www.causeweb.org/cause/uscots/uscots23/4d-discussing-role-instructor-and-instructional-designer-fully-asynchronous>
- Questions and comments can also be shared in [Padlet Discussion](#)





# Teaching modalities

Session Activity 1: Share your experience of using different teaching modalities (5 mins).

Mode/Criterion	Fully Online	Remote	Blended/hybrid	Dual Mode/Hy-Flex
<b>Academic Rationale</b>				
	<ul style="list-style-type: none"> <li>- Flexible learning, carried out on the students' own time; consider:</li> <li>- student demographics &amp; needs</li> <li>- commitments: family, employment, etc.</li> <li>- residence / location - esp. remote students &amp; broadband access</li> <li>- time to degree completion</li> <li>- departmental curricular &amp; pedagogical goals, class sizes.</li> </ul>	<ul style="list-style-type: none"> <li>- <a href="#">Emergency strategy</a> (cf. the pivot to remote teaching in March 2020);</li> <li>- Replicating live in-class lecturing with live lecturing through video-conference;</li> <li>- Some adjustments to be made to learning assessments: convert proctored exams to alternatives</li> <li>- Less planning/set-up time needed than a typical online course.</li> </ul>	<ul style="list-style-type: none"> <li>- Live, in-person classes allow for spontaneity, and responsive discussion of sensitive topics;</li> <li>- Asynchronous online engagement in forum discussions allows for thoughtful testing and sharing of ideas, and more carefully crafted writing.</li> <li>- Hybrid formats allow the intentional blending of the best of live and online modalities.</li> </ul>	<ul style="list-style-type: none"> <li>- See Fully Online.</li> <li>- Provides student with choice</li> <li>- Accommodates students who are unable to travel to campus and be present in a classroom (location, disability, health concerns, caring commitments, etc).</li> </ul>
<b>Pedagogy</b>	<i>What are the essential features of this modality?</i>			
	<ul style="list-style-type: none"> <li>- No in-person meetings with an intentionally designed online experience</li> <li>- Can be fully-asynchronous or there can be some synchronous online sessions</li> <li>- Asynchronous learning may include recorded lectures (replayable); online discussions, quizzes, blogs, group work, meta-reflection.</li> </ul>	<ul style="list-style-type: none"> <li>- An online modality introduced by the pandemic, indicating a rapid shift to distance learning that relies heavily on video conferencing and may or may not have a substantial LMS (LMS) component</li> </ul>	<ul style="list-style-type: none"> <li>- Live in-person lectures + asynchronous online study</li> <li>- Both modes should connect and cross refer, eg. continue an in-person discussion in online forum; discuss forum posts in class</li> </ul>	<ul style="list-style-type: none"> <li>- Combining in-class and remote students simultaneously during the class session</li> <li>- Course content and online activities provided in LMS.</li> <li>- See <a href="#">this UCI guide</a>. (Merage School of Business).</li> </ul>
<b>Overall Goal + Learning Outcomes or Objectives</b>	<p style="text-align: center;"><b>Program level goals</b> are distributed and articulated across program courses;            Course level goals are student-centered, achievable, measurable, aligned with the learning assessments.            - Learning outcomes measure learning and achievement, in place of "time in class".</p>			<ul style="list-style-type: none"> <li>- See Fully Online, Blended. In Dual Mode courses, course learning outcomes or objectives must be equally achievable whether the student attends live classes,</li> </ul>



# An Instructional Designer may be Involved in Each of the Online Modalities

Introducing UNC's

## Instructional Designers

### Communicators/ Collaborators

Listening, speaking, writing and presenting are all important parts of our day-to-day work. We communicate and collaborate to build relationships and support with faculty and staff, so we can work together effectively and efficiently.

### Guides

Whether you are developing a totally online course or just need help with Blackboard, whatever instructional issue you face, we can guide you along the way.

### Builders

We bring a systematic approach to designing and building learning. Using Quality Matters and best practices as our guide, we create blueprints, templates, documents, outlines, and tutorials to help you build courses.

### Fixers

When a course link breaks, when a weighted grade column doesn't add up, we can be there to help. We fix things that are broken. We solve problems.

### Superheroes

Look up in the sky! It's a designer, teacher, technologist, problem solver, collaborator. It's an ID!



### Thinkers

We think about things. We brainstorm. We look for new and better ways to communicate, teach, design, work.

### Designers

We design instruction/teaching and learning experiences. At the heart of the matter is the alignment of objectives, assessments and materials.

### Project Managers

We are working on multiple projects all the time. New online programs, new online courses, new versions of software, workshops, student orientations, new faculty orientations, maintenance of existing systems and courses... we have many projects to manage. All in a day's work.

### Explorers

It's important to stay on top of the latest technology, skills, best practices and processes. We are constantly exploring new ideas and how to apply them.

**UNC**  
UNIVERSITY OF NORTHERN COLORADO

Extended Campus

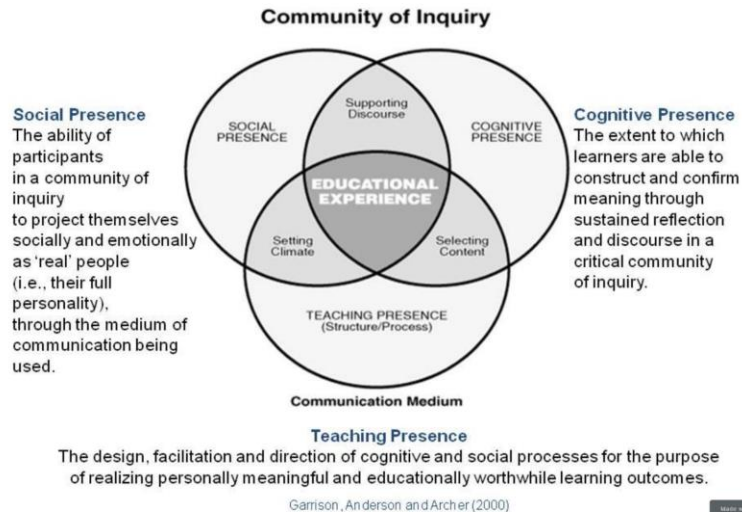
**Instructional design**, also known as instructional systems design or instructional systems development (ISD), is the practice of creating learning experiences to support learning. It is a systems approach to analyzing, designing, developing, implementing, and evaluating any instructional experience based on the belief that training is most effective when it gives learners a clear statement of what they must be able to do after training and how their performance will be evaluated.

An **instructional designer** applies learning theory and a systemic approach to design and develop content, learning activities, training, and other solutions to support the acquisition of new knowledge or real world skills.

[What is Instructional Design? | ATD](#)

\*Adapted from "Introducing the ASU Instructional Designers" infographic.

# Community of Inquiries vs Universal Design for Learning (UDL) vs Diversity, Equity, Inclusion & Accessibility (DEI & A)



## Universal Design for Learning Guidelines

	<b>Provide multiple means of Engagement</b> → <small>Affective Networks The "WHY" of learning</small>	<b>Provide multiple means of Representation</b> → <small>Recognition Networks The "WHAT" of learning</small>	<b>Provide multiple means of Action &amp; Expression</b> → <small>Strategic Networks The "HOW" of learning</small>
Goal	<b>Provide options for Recruiting Interest</b> (7) ○ <ul style="list-style-type: none"> <li>Optimize individual choice and autonomy (7.1) →</li> <li>Optimize relevance, value, and authenticity (7.2) →</li> <li>Minimize threats and distractions (7.3) →</li> </ul>	<b>Provide options for Perception</b> (1) ○ <ul style="list-style-type: none"> <li>Offer ways of customizing the display of information (1.1) →</li> <li>Offer alternatives for auditory information (1.2) →</li> <li>Offer alternatives for visual information (1.3) →</li> </ul>	<b>Provide options for Physical Action</b> (4) ○ <ul style="list-style-type: none"> <li>Vary the methods for response and navigation (4.1) →</li> <li>Optimize access to tools and assistive technologies (4.2) →</li> </ul>
	<b>Provide options for Sustaining Effort &amp; Persistence</b> (8) ○ <ul style="list-style-type: none"> <li>Heighten salience of goals and objectives (8.1) →</li> <li>Vary demands and resources to optimize challenge (8.2) →</li> <li>Foster collaboration and community (8.3) →</li> <li>Increase mastery-oriented feedback (8.4) →</li> </ul>	<b>Provide options for Language &amp; Symbols</b> (2) ○ <ul style="list-style-type: none"> <li>Clarify vocabulary and symbols (2.1) →</li> <li>Clarify syntax and structure (2.2) →</li> <li>Support decoding of text, mathematical notation, and symbols (2.3) →</li> <li>Promote understanding across languages (2.4) →</li> <li>Illustrate through multiple media (2.5) →</li> </ul>	<b>Provide options for Expression &amp; Communication</b> (5) ○ <ul style="list-style-type: none"> <li>Use multiple media for communication (5.1) →</li> <li>Use multiple tools for construction and composition (5.2) →</li> <li>Build fluencies with graduated levels of support for practice and performance (5.3) →</li> </ul>
	<b>Provide options for Self Regulation</b> (9) ○ <ul style="list-style-type: none"> <li>Promote expectations and beliefs that optimize motivation (9.1) →</li> <li>Facilitate personal coping skills and strategies (9.2) →</li> <li>Develop self-assessment and reflection (9.3) →</li> </ul>	<b>Provide options for Comprehension</b> (3) ○ <ul style="list-style-type: none"> <li>Activate or supply background knowledge (3.1) →</li> <li>Highlight patterns, critical features, big ideas, and relationships (3.2) →</li> <li>Guide information processing and visualization (3.3) →</li> <li>Maximize transfer and generalization (3.4) →</li> </ul>	<b>Provide options for Executive Functions</b> (6) ○ <ul style="list-style-type: none"> <li>Guide appropriate goal-setting (6.1) →</li> <li>Support planning and strategy development (6.2) →</li> <li>Facilitate managing information and resources (6.3) →</li> <li>Enhance capacity for monitoring progress (6.4) →</li> </ul>
	<b>Expert Learners who are...</b> <b>Purposeful &amp; Motivated</b>	<b>Resourceful &amp; Knowledgeable</b>	<b>Strategic &amp; Goal-Directed</b>

Access the original Col framework on [The Community of Inquiry](#)

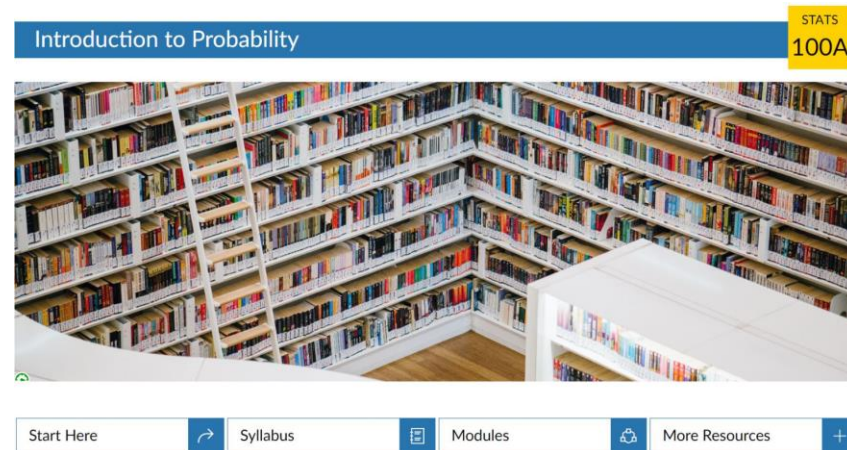
Access the original UDL guidelines on [CAST \(Center for Applied Special Technology\)](#)



# Example: STATS 100A - An iterative process of collaboration between teacher and designer in a fully asynchronous course

## Timeline of course and learning outcomes:

- Spring 2021: OTL Workshop and start of partnership with instructional designer (Sirui, OTL personnel).
- Summer 2021: recordings of lectures in studio, collaborative development of Canvas platform for asynchronous learning (Sirui, OTL studio, Juana)
- Fall 2021- present. Continued collaboration (Sirui, Juana)
- The asynchronous Stats 100A is offered by the Department of Statistics and Data Science at UCLA each quarter. One or two in-person versions are also offered.







# The course in the UCLA curriculum context

## Course Overview:

- Calculus based upper division course for STEM majors. Taught at UCLA for more than 25 years in person.
- First course in the theory sequence at UCLA Dept of Statistics and Data Science.
- Enrollment averages 80 students per quarter, juniors and seniors.
- Asynchronous delivery in Canvas, the official LMS at UCLA since 2022.
- Modular design of learning units
- A variety of content presentation methods (pre-recorded videos, readings, activities, etc.)
- Integrated with educational technology (Learning Glass, Gather Town, Quiz-in-video, etc.)
- TAs participation and lead in synchronous Discussion sessions
- Social presence of professor and TA via synchronous zoom office hours.
- Inclusive learning: students enrolled have access to the online textbook and active learning from the start, and the reduced price of the textbook is billed through student accounts.
- UDL based



# An iterative process of collaboration between the instructor and the designer

Go to the course sandbox that we prepared for this breakout session:

<https://bruinlearn.ucla.edu/courses/153114>

In addition to the two weekly modules (Week 1 & Week 4), you will see information modules always in the web site, and you will notice modules where we put examples of the highlights discussed across several course offerings.

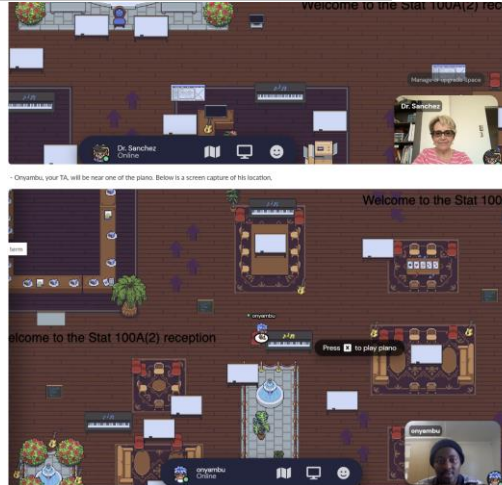
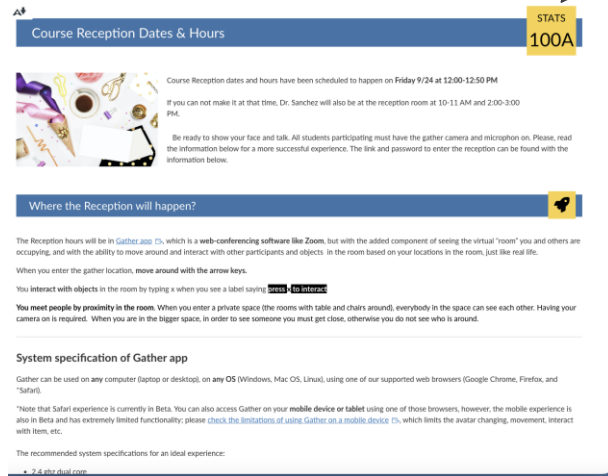
Pay attention to the pages of **Gather Town** and **TA session**, which we will talk about the iterative design process in the next few slides.



# An Iterative Process - Engagement with each other in Gathertown (with structure)

FALL 2021

How GatherTown is selected and designed for engagement?



Gathertown reception in week 1.



Some Office hours in Gathertown

Use Canvas page to provide the Gathertown reception instructions, which prepares students before the reception.

# Feedback from students and groups forming after the reception overwhelmingly positive in Fall

Instructor: some students liked the structured questions to ask each other, but some wanted room to ask their own questions for the assignment.

In reception, some students thought there were too many gadgets.

- a. Yes the app was easy to navigate.
- b. Yes I have met more than 3 people and have met the professor and the TA. It's a unique experience. In the app, I enjoyed meeting new people in a unique setting.
- c. I interacted with all of them, I played the piano, watched the videos and found them catchy, entertaining and useful for the class. I also had a glimpse on how to play poker and interacted with the bulletin boards scattered around contained the task we had to do for that day.
- d. I think the event held on 9/24 was a great start and I am hoping we get to experience events similar to that with different task and have a team, so we can work together and problem solve as a team.
- e. Talking to people, in the midst of the pandemic, it is great to have this opportunity to communicate with colleagues. It was also helpful to meet the professor and TA. They have address all of my concerns. Instructions were straightforward and everyone was very helpful.
- f. Yes, I learned how to play poker.
- g. I think we should have events like this often :)

Designer: a potential group need.

In reception, some students wanted more Gathertown events during the quarter, a few thought that one was enough.

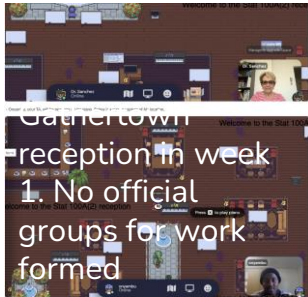
Some students enrolled late and missed it, so wanted it at week 2.



# An Iterative Process. Engagement with each other in Gathertown (with structure)

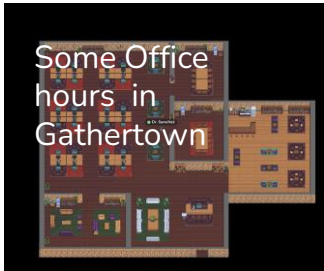
FALL 2021

SPRING 2022



Gathertown reception in week 2 - Groups for the quarter formed

Students realized that community was formed and this additional social not needed.



Had gathertown meeting week 9 to select new groups for last hwk in week 9.

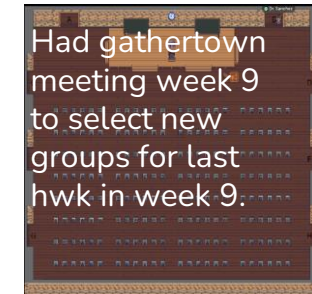
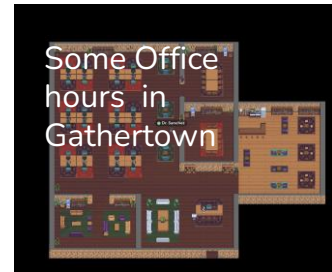
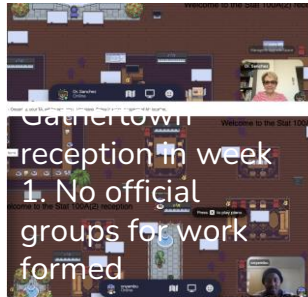


# An Iterative Process. Engagement with each other in Gathertown (with structure)

FALL 2021

WINTER 2022

SPRING 2022



Removed meeting in week 9

New: items from “getting to know you discussion” of week 1 added to space caused technical problems (pictures, paintings..)

New questions replaced old ones. They also answered to others (about their role models, how they cope with uncertainty, and what makes them unique.) Students added their own questions.



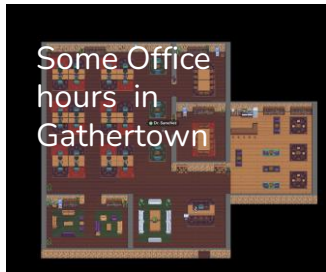
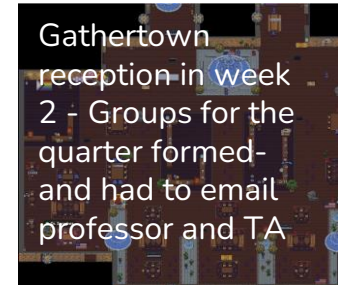
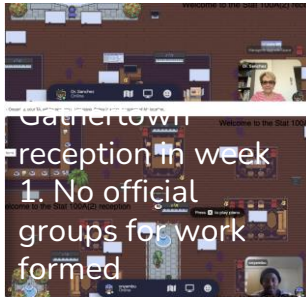
# An Iterative Process. Engagement with each other in Gathertown (with structure)

FALL 2021

WINTER 2022

SPRING 2022

FALL 2022



Some students felt that the meeting in week 9 not needed.

Items from “getting to know you” removed and simplification of space.





# Example of questions students are given to engage with the group they find in gathertown: Fall 2022.

**Question 1:** Enter the names of the four members of the group with the last 4 digits of their student ID and the emails you will use to communicate and (prof) can use to communicate with you

Name of four students and their email address and ID goes here.

**Question 2:** What does each member of the group think about the following: if UCLA was considering moving to a semester system, and you had to vote on it, would you vote yes or no? And why? Explain a little.

**Question 3:** What is your most constructive behavior (does help the group do well) when working with a group of people? What is your most destructive behavior (does not help the group do well) when working with a group of people?

**Question 4:** Do you have any siblings in your family and do all of you follow the same teams in sports?

**Question 5:** As a group, decide another question that you want to ask each other, write the question, and then write what each of you responded.

**Students' question:** What's the coolest place in LA that you've been to, in your time as a UCLA student?





## Session Activity 2 - Knowing your peers in Gather Town (5 mins)

**Time:** 6/3/2023 3 AM PDT - 6/4/2023 2:30 PM PDT (This link is for presentation only. See new link among CAUSE Resources (to be posted))

**Location:** <https://app.gather.town/app/Bb4liZV9tqBAnuZa/Stat100AReception>

**Password:** uscots63



### Activity Instructions and Goals

- Introduce each other
- Find a group of two or three people
- Ask each other two questions: Other than Covid era remote teaching, have you tried one of the modalities of online teaching mentioned?



# An Iterative Process: Engagement with the TAs in Zoom Discussion Sessions

FALL 2021



Activities with the TA week 5

Week

5

Share with the TA and other students in the class

[Do you have any questions - this week? This is not a graded Discussion. The discussion must be focused on the material listed below for this week. Use the general discussion forum or Dr. Sanchez's office hour forum for other content or Canvas questions.](#)

These are the TA session activities planned for this week:

[Marchette and Wegman](#) ↓ used the Binomial model in their paper. Identify the research question for which the Binomial model is used. Identify the random variable for which they used the model, the probability of success ( $p$ ) and sample size ( $n$ ) parameters. Then describe in your own words how the model is used to answer the research question.

[TA Discussion Session 2A Thursday 9am-10am](#) ↗



**Focus:** Engage students with content presented in alternative formats (present in posted supplements to the lectures, plus some practice exercises from the textbook).

**Problem:** The TA session was on Wednesday mornings. Students reported not having studied the material yet, let alone the supplementary materials

Designer: How to be more efficient about TA sessions?

# An Iterative Process: Engagement with the TAs in Zoom Discussion Sessions

A task: to find the solution to encourage attendance in TA sessions.

FALL 2021

WINTER 2022

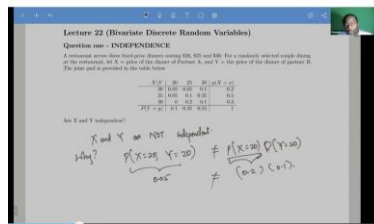
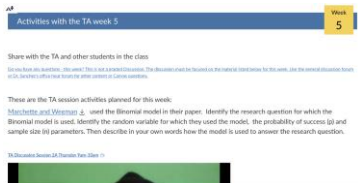
Students found the videos very useful.

But attendance in the TA session did not increase. Particularly the Friday 8:00 AM one.

Some students wanted more challenging questions discussed, questions like in assignments.

- Sessions moved to Friday to give time to students to study lectures.
- New strategy: bring questions they may have about the quizzes embedded in the pre-recorded lectures or the reading assigned in the module.

Because TA session is on Wednesday, students were not ready for TA session.

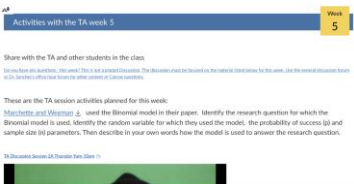


# An Iterative Process: Engagement with the TAs in Zoom Discussion Sessions

FALL 2021

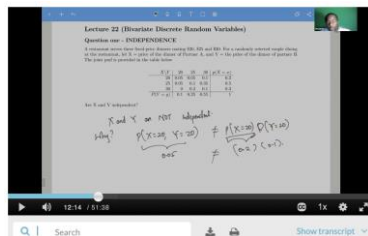
WINTER 2022

SPRING 2022



-Sessions moved to Friday to give time to students to study lectures before TA session.

-New strategy: bring questions they may have about the quizzes embedded in the pre-recorded lectures or the reading assigned in the module.



Because TA session on Wednesday, students were not ready for TA session.

A mixture of embedded quizzes and practice exercises from the textbook and discussion of the few supplementary materials.



Attendance still very low. We needed to find out: is it that students can not attend or they choose not to attend because they have the videos?

# An Iterative Process: Engagement with the TAs in Zoom Discussion Sessions

FALL 2021

WINTER 2022

SPRING 2022

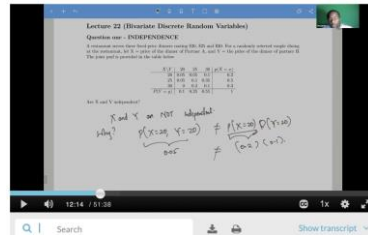
FALL 2022



Because TA session on Wednesday, students were not ready for TA session.

-Sessions moved to Friday to give time to students to study lectures before TA session.

-New strategy: bring questions they may have about the quizzes embedded in the pre-recorded lectures or the reading assigned in the module.



A mixture of embedded quizzes and practice exercises from the textbook and discussion of the few supplementary materials.



-A google doc asks students to submit the questions they had before the TA session.  
 --Students are rewarded with tokens exchangeable for other activities for attendance and engagement.  
 -Tokens can be earned by actively participating the session, and assessed by low-stake end of session graded quiz  
 Attendance almost 90%  
 Extreme satisfaction of students with token policy.





# An Iterative Process: Engagement with the TAs in Zoom Discussion Sessions

FALL 2021

WINTER 2022

SPRING 2022

FALL 2022

- Most enrolled students would attend TA session if rewarded with participation points.
- But a few would not. They scheduled classes at the same time, so they could not earn the tokens and therefore could not exchange them for questions on exams or quizzes.
- Students valued the videos of the discussion a lot.
- Students wait until the later days of the week to engage with the course content.
- So in the current offering of Stats 100A we are assessing students in mid week and end of the week. That has resulted in something in between the very low attendance and the very high attendance of the tokens.



# An Iterative Process: Engagement through collaborative group project

FALL 2021

Students given the option to choose between an individual scaffolded project with secondary data or a final exam as final assessment of the course.

Approximately one third of students chose that.

SPRING 2022

Scaffolded individual final project replaced with group homework sets that ask students to apply concepts learned to new settings, engage with published literature or collect some data and do some basic model fitting.  
Required of all students.

WINTER 2022

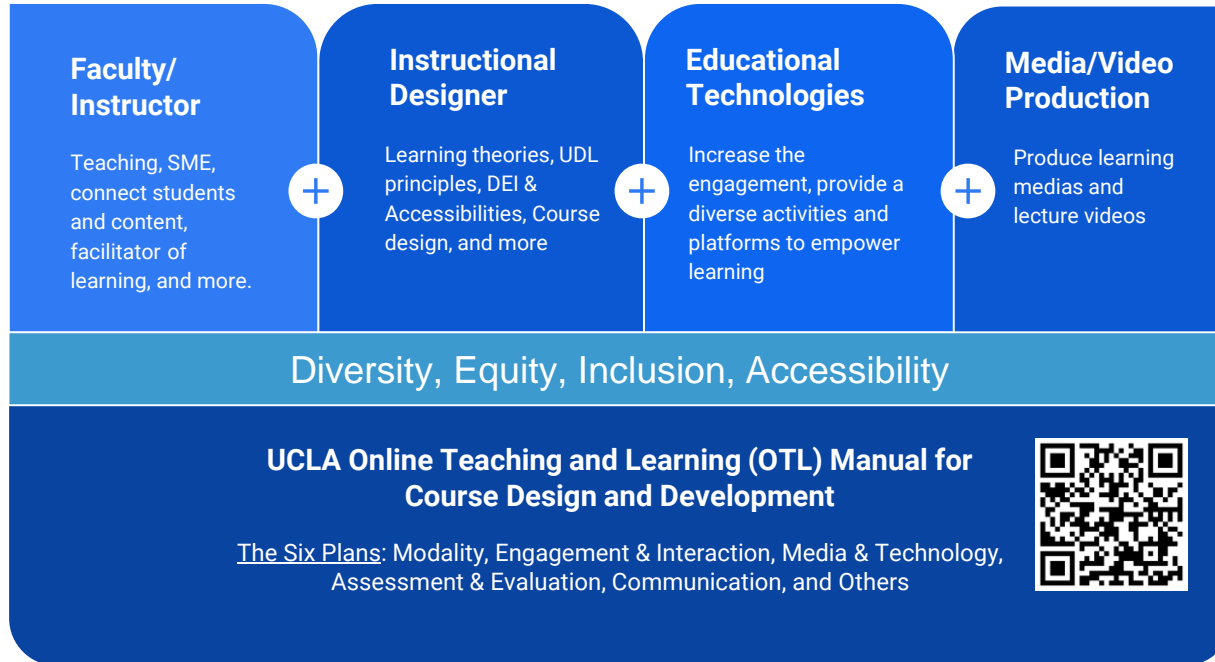
A Group scaffolded homework project with three milestones. The whole class collects data and shares it with the class, models are fit to the data and empirical probability questions are answered with the data, and then the data is used to illustrate main probability concepts.

FALL 2022

Group scaffolded project continues in the same scaffolded, three milestones format. But before doing the three-steps homework project, the groups are given a chance to interact doing two independent homework with minor tasks.



# The Collaboration: Instructor & Instructional Designer







## Session Activity 3: Feedback in Padlet (5 mins)

Take some time to reflect on how you feel the examples can help with your teaching, or any questions and feedback you want to share.

The discussion will happen in Padlet; we can also take questions from the group.

Click the link to [Access the Discussion in Padlet](#); or use the QR code to access the discussion.



# Course Design Highlight 1 - Interactive Video Lectures with built-in Assessments

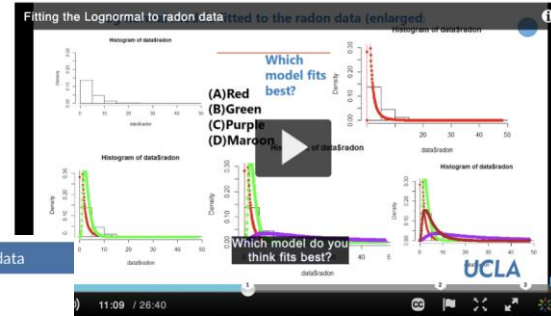
Lecture 12 Fitting a log normal model to nonnegative sampling data



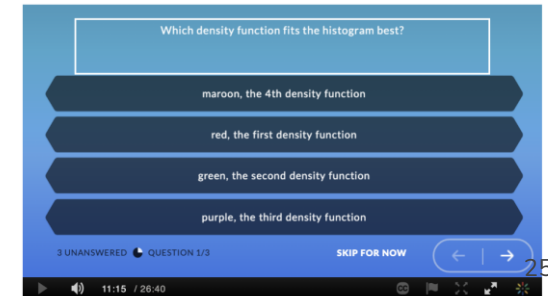
Lecture 12 Fitting a log normal model to nonnegative sampling data



Lecture 12 Fitting a log normal model to nonnegative sampling data



Lecture 12 Fitting a log normal model to nonnegative sampling data





# Course Design Highlight 2: Engagement with Content - Using Learning Glass (LG) Videos

Lecture 14 Expectation of functions of random variables- theory applicable to discrete and continuous random variables.



The lecture on expectation of functions of random variables has been split into several very short segments to make it easier for you to see the main 4 points we want to make. Watch them in sequence, as what is learned in one is used in the others.

Lecture 14.A "LOTUS- Expectation of functions of random variables" (shows the general methodology to use in videos that follow).

The video shows a woman writing on a blackboard. The text on the board includes:

- LOTUS:  $E(a_1X_1 + a_2X_2 + \dots + a_nX_n) = a_1E(X_1) + a_2E(X_2) + \dots + a_nE(X_n)$
- Definition:  $E(X) = \sum x P(x)$  and  $E(X) = \int x f(x) dx$
- Application:  $E(X) = E(\sum_{i=1}^n X_i) = \sum_{i=1}^n E(X_i)$

The video player interface shows a search bar with the text "Search", a "Show transcript" button, and a progress bar at 6:10 / 16:40.

Instructor used Learning Glass to demonstrate lecture content.

The Learning Glass technology helps students to virtual learn how to do proofs and how to solve realistic problems.

# Course Design Highlight 3: Engagement with Content - Just-in-time Videos

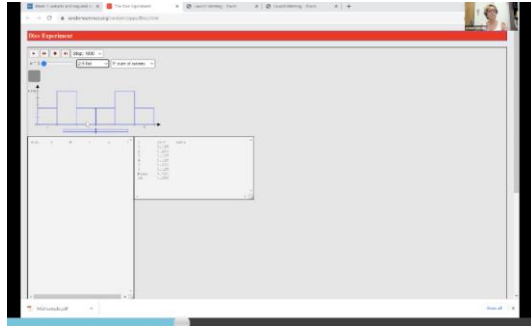


Figure 1

Handwritten mathematical derivations for probability calculations. The first part shows the calculation of  $1 - P(X < 2) = 1 - \int_0^2 \frac{1}{2} e^{-x/2} dx = 1 - [-e^{-x/2}]_0^2 = 1 - [-e^{-1} - (-e^{-0})] = 1 - [-e^{-1} - (-1)] = 1 - [-e^{-1} + 1] = e^{-1}$ . The second part shows  $P(X > 10 | X > 9) = \frac{P(A \cap B)}{P(B)} = \frac{P(X > 10 | X > 9)}{P(X > 9)}$ . A diagram below shows two overlapping intervals A and B on a number line, with A from 9 to 10 and B from 9 to 10.

Handwritten notes on a video player showing a table of intervals and proportions. The table has columns for '# of intervals', 'In how many intervals', 'Prop. of intervals with', and 'Proportion predicted by Poisson with'. The data is as follows:

# of intervals	In how many intervals	Prop. of intervals with	Proportion predicted by Poisson with
0	0	$0/46 \approx 0$	$3.55^0 e^{-3.55} = 0.021$
1	13	$13/46 \approx 0.28$	$3.55^1 e^{-3.55} = 0.075$
2	15	$15/46$	
3	16	$16/46$	
4	2		
5	10		
6	4		
7	2		
8	1		
9	2		
10+	6		

Additional notes include "76 intervals" and "On average how many per interval".

Lecture 21. Bivariate continuous random variables; preliminaries. Sections 8.1-



chapter10-babyboom-key-1.pdf

Download chapter10-babyboom-key-1.pdf (456 KB)

Number of Births	Empirical Probability (observed)	Theoretical Probability (Poisson model)
0	0.021	0.021
1	0.28	0.075
2	0.33	0.14
3	0.35	0.17
4	0.04	0.02
5	0.02	0.00
6	0.01	0.00
7	0.01	0.00
8	0.01	0.00
9	0.01	0.00
10+	0.01	0.00

The columns with the empirical and the theoretical probabilities do not match exactly. The

generalization of the definition of independence when there are more than two random variables, applied to both discrete and continuous random variables. Required.

Joint probabilistic behavior of many independent entities.

# Course Design Highlight 4: Engagement with Content - Guest speaker and lecture videos by students

Guest Lecturer's video

Watch the video "Judgments under uncertainty. Applications of Probabilistic Reasoning," by Maureen Gray, Psychology Department, UCLA. It illustrates the problems that we humans have in applying probability properly and how Bayes Theorem can help.

The screenshot shows a video player with a slide titled "Working at the Salty Spitoon". The slide contains the question: "How likely is Spongebob to be a tough guy?". To the right of the text is a cartoon illustration of a building with a sign that says "THE SALTY SPITTOON". Below the text is a small video player showing a cartoon character (Spongebob) and a man. The video player interface includes a progress bar at 4:55 / 13:50, a search bar, and a "Show transcript" button.

Resources recommended by Maureen Gray (required reading):

- Here is a good short summary of the representativeness heuristic with some of the examples from the original Tversky and Kahneman studies. An example of career direction. Their "About Us" page explains their aim and approach.

[Representativeness Heuristic](#)

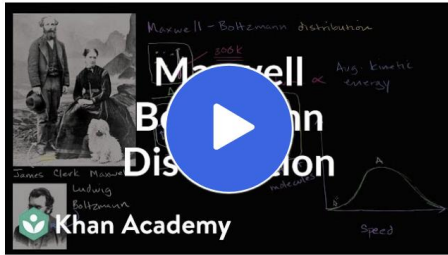
Modern Probabilistic Models in Artificial Intelligence, by Dr. Ruiqi Gao, Google., Ph.D. UCLA Department of Statistics, 2021

The screenshot shows a video player with a slide titled "Multinomial Distribution". The slide features a visual representation of face combinations: three columns of faces, followed by a minus sign, a plus sign, and an equals sign, leading to a final column of faces. The video player interface includes a progress bar at 0:08 / 8:49, a search bar, and a "Show transcript" button.

# Course Design Highlight 5: Engagement with Content - Supplementary videos and readings connecting with majors

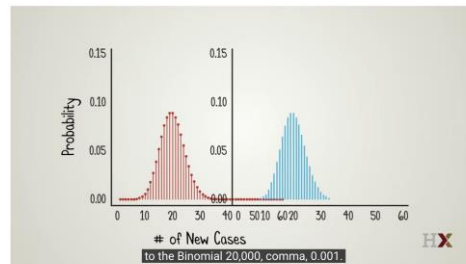
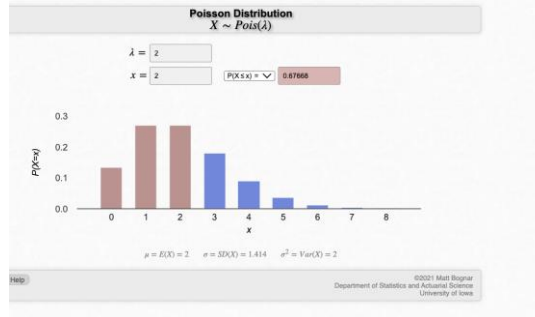
## The Maxwell-Boltzmann distribution

AP.Chem: SAP-7 (EU), SAP-7.B (LO), SAP-7.B.1 (EK), SAP-7.B.2 (EK), SAP-7.B.3 (EK), SAP-7.B.4 (EK) [Google Classroom](#)

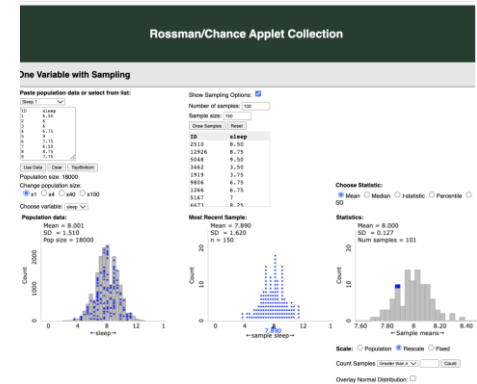


[About](#) [Transcript](#)

The Maxwell-Boltzmann distribution describes the distribution of speeds among the particles in a sample of gas at a given temperature. The distribution is often represented graphically, with particle speed on the x-axis and relative number of particles on the y-axis. Created by Sal Khan.



Understanding Discrete Random Variables and Probability Distributions  
Stat\_v1 1.38K subscribers  
5.3K views 4 years ago



The Hypergeometric Distribution: An Introduction (fa... [Copy link](#)

Had the sampling been done with replacement, using the binomial distribution would be appropriate.

$$P(4 \text{ doctors}) = \binom{5}{4} \left(\frac{6}{25}\right)^4 \left(1 - \frac{6}{25}\right)^{5-4}$$



# Course design highlight 6: Discussions are themed and allow students to share their social interests or major.

## Theme this week

A big topic this week in lectures is whether the distribution of a random variable  $X$  is different for subgroups of the population or whether the distributions of the random variable for the subgroups is no different from the distribution of the overall population. For example, is the distribution of IQ for persons with cold noses different from the distribution of IQ for persons with warm noses? In our technical language, is the conditional distribution of IQ when nose temperature is cold, different from the conditional distribution of IQ when nose temperature is warm? If the conditional distributions are different, that would be an indication of no independence between nose temperature and IQ. If they are not different, then the distribution of the IQ for all, without looking at group would be the same as the conditional distributions of the subgroups, and the latter would be equal to the marginal distributions.

By different distributions we mean that the distributions could differ in shape, expected value, variance, minimum and maximum values of the random variable, for example.

Your job this week is to suggest a random variable for which the distribution of the random variable is different for different subgroups of the population. Define the random variable, and also the subgroups. Then explain how the distributions differ. Provide some evidence in the form of some study (a url is ok for the study) or your own research.

Contribute meaningfully to make participation points with your own submission. Then comment on at least two other students' contribution -comment critically and constructively, not just with ok, cool, like it....

## Theme this week.

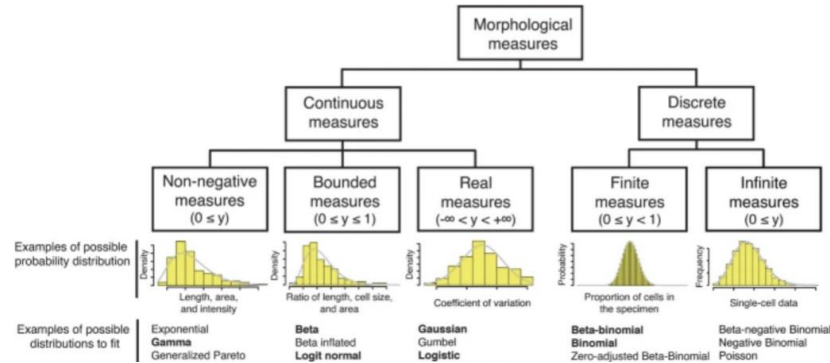
Search the literature in your major, journals and such, and find an article where probability distributions are used or fitted to a real data set to learn something new about an aspect of your major. If you are a Stats major or math major or a methodology only major find journals on areas that interest you and do the same as described in the previous paragraph. Saying "I do methods" and "I analyze any data" is not excuse not to find an article.

# Discussion highlight 6: Another discussion. Examples.

<https://bmcbiol.biomedcentral.com/articles/10.1186/s12915-022-01283-6>

My major is computational and systems biology. The article I found that uses probability distributions on real fitted data is the paper on "Assignment of Unimodal Probability Distribution Mo Morphological Phenotyping". The probability models utilized involve the Gamma, Beta, and Gaussian model. In this article we seem that researchers observe morphological features and create distributions. Using these probability distributions we are able to determine the approximate probabilities of a morphological feature such as length.

Fig. 3



Student 1

Theme: Find probability models used in your major and share a link to an article where they appear.

For this week's discussion post, and in line with our current lectures about various probability distributions, I found a paper that fits a gamma distribution to human neurocognitive reaction time. In Cognitive Science (my major), reaction time is an important metric that has clinical implications (used to diagnose certain neurodegenerative diseases), and for user experience research as well (how fast are people to recognize diverse stimuli). The authors argue that a gamma distribution would fit the data better, despite historically using the Gaussian to model reaction time.

Link: <https://dl.acm.org/doi/10.1145/3167918.3167941>

Student 2



# Course Design Highlight 7 - Gather Town for Course Reception

Please, read about the  
Course Reception Date & Hours (reception is on October 6)

100A



Course Reception dates and hours have been scheduled to happen on **Thursday, October 6th, 1-4 PM**. There will be three questions scattered around the room that must be found and solved with a group of four people (including yourself).

Students with last name starting with the letters A-J expected 1-2 pm

Students with last name starting with the letters K-P expected 2-3 PM

Students with last name starting with the letters Q-Z expected 3-4 PM

If you can not make it at your designated time, stop by during the other times.

<https://app.gather.town/invite?token=Gh-6cX58TkuQ19jvrVc>

Password: stats



Stop by during that time interval allocated to you to meet other students in the class, ask questions about the course, have some fun, participate in some raffles and decide who will be in your group for the assignment questions that will be found in Gather town.

Be ready to show your face and talk. All students participating must have the gather camera and microphone on. Please, read the information below for a more successful experience. The link and password to enter the reception can be found with the information below the same day of the reception.

Where the Reception will happen



The Reception hours will be in [Gather app](#), which is a **web-conferencing software** like Zoom, but with the added component of seeing the virtual "room" you and others are occupying, and with the ability to move around and interact with other participants and objects in the room based on your locations in the room, just like real life.

When you enter the gather location, **move around with the arrow keys**.

You **interact with objects** in the room by typing x when you see a label saying **press x to interact**

**You meet people by proximity in the room.** When you enter a private space (the rooms with table and chairs around), everybody in the space can see each other and talk to each other without others outside being able to see or hear you. Having your camera on is required. When you are in the bigger space, in order to see someone you must get close, otherwise you do not see who is around

Please, give us some feedback about the "gather town" reception

This is a preview of the published version of the quiz

Started: Feb 11 at 11:57am

## Quiz Instructions

If you participated in the gather town reception of 9/24, would you be so kind to tell us what did you think? It would be helpful for us to know about the following:

- (a) Did you find it easy to navigate?
- (b) Did you meet more than the three people you interviewed? Was that something that you enjoyed?
- (c) How many objects did you interact with? Can you tell us which? Which ones did you like or dislike?
- (d) What would have made the reception more useful and enjoyable?
- (e) What did you like the most? What the least?
- (f) Did you enter any of the private rooms (the ones with table and chairs around)?
- (g) Do you think we should have more events like this in gather town?



Question 1

1 pts

Use this space to give us your feedback. Try to use the letters we use to address the items listed. For example, if you are going to talk about item (b) write:

(b) "I think....." etc...

Edit View Insert Format Tools Table

12px Paragraph B I U A T<sup>2</sup> :



# Statistics Literature on Online Teaching of Statistics Reveals the Experiences of Some Teachers in This Spectrum of Online

- [Tudor. Teaching introductory Statistics Online. Satisfying the Students. JSE 2007.](#)
- [Mills and Raju. Teaching Statistics Online: A Decade's Review of the Literature About What Works. JSE 2011](#)
- Dutton and Dutton. Characteristics and Performance of Students in an Online Section of Business Statistics. JSE 2017
- [Burnham, Blankenship and Brown. Full article: Designing a Large, Online Simulation-Based Introductory Statistics Course \(tandfonline.com\) JSE 2022.](#)



# Other resources on online asynchronous teaching

## Organization and Community

- [Association for Educational Communications and Technology \(AECT\)](#)
- [The Community of Inquiry \(CoI\)](#)
- [Center for Applied Special Technology \(CAST\)](#)

## Research and Resources

[Leadership in online learning in higher education: Why instructional designers for online learning should lead the way](#) (Wiley Online Library, 2011)

[Instructional strategies and course design for teaching statistics online: perspectives from online students](#) (SpringerOpen, 2017)