GUIDE TO **UNIVERSAL DESIGN FOR LEARNING** IN

# DIGITAL TECHNOLOGY

Modernizing Industries and Connecting Communities

CTE TECHNICAL ASSISTANCE CENTER OF NY

## ABOUT THIS GUIDE

**Universal Design for Learning (UDL)** is a framework for designing learning experiences that are inclusive, accessible, and engaging for all students. UDL is not a checklist of required practices, but a mindset of continuous improvement. By increasing flexibility and options, UDL helps teachers proactively remove barriers, meet students where they are, and provide everyone with an equal opportunity to learn.

This document is part of a series that illustrates how UDL principles can be applied in each of Advance CTE's 14 career clusters. The series extends and tailors the tips provided in two prior publications, Supporting All Students in New York State CTE Programs [PDF] and Supporting Special Populations in New York State CTE Programs [PDF], available on the CTE TAC's website.

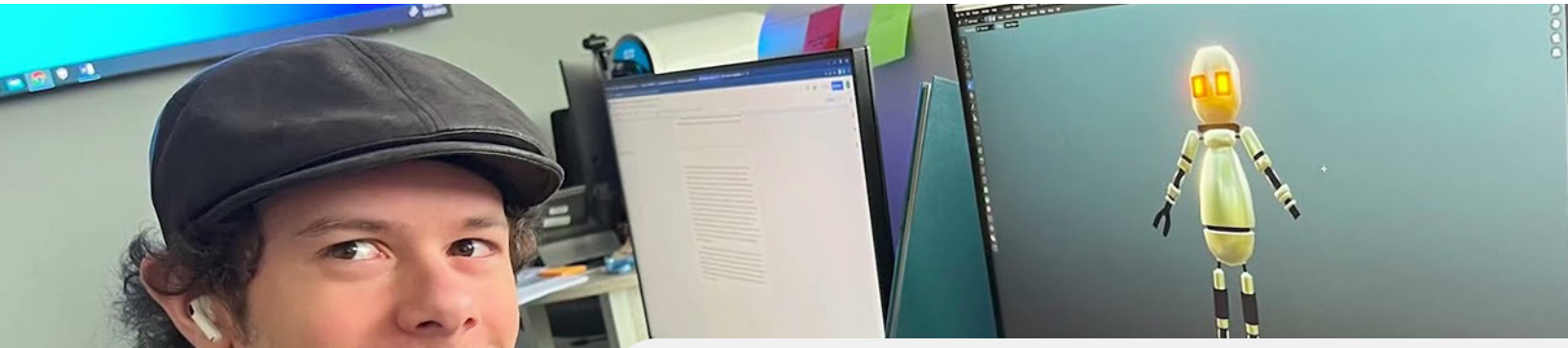

*Photo: Capital Region BOCES*

**With its emphasis on relevant, authentic, hands-on learning, UDL is a natural fit for CTE classrooms!**

## 5 REASONS WHY UDL WORKS FOR CTE DIGITAL TECHNOLOGY

1. Digital technology is relevant to a wide range of occupations, subject areas, and industries. Through **self-directed learning**, UDL broadens the range of perspectives and career paths students can explore.
2. Students with differences in mobility, sensory perception, and cognition may encounter barriers when using digital tools and technology. UDL helps to ensure that **all students are appropriately included and involved in learning activities**.
3. Digital technology is all about innovation. By **emphasizing agency and choice**, UDL empowers students to follow their passions, think outside the box, and unleash their creativity.
4. UDL's emphasis on **multiple pathways to achieve goals and solve problems** enhances students' ability to tackle complex challenges in a fast-paced, rapidly evolving industry.
5. Technology is increasingly integrated into virtually all aspects of our daily lives, making the field **relevant to diverse students**.

# QUICK REFERENCE GUIDE TO UDL FOR CTE

**Universal Design** is the process of creating objects, environments, and experiences that can be accessed, understood, and used to the greatest extent possible by people with a wide range of abilities, needs, and characteristics. Universal Design for Learning (UDL) applies the concept of Universal Design to learning contexts.

**UNIVERSAL:** UDL is a framework for **creating learning experiences that work for *everyone***. Proactively identifying and removing barriers to learning creates a more inclusive environment where all students have equitable opportunities to learn.

**DESIGN:** There is no one approach to learning that is optimal for every student in every situation. The UDL principles guide teachers to **plan for learner variability by offering flexibility and options**.

**FOR LEARNING:** Rather than a one-size-fits-all approach, **UDL empowers students to tailor the learning experience** for their individual needs, goals, and preferences. By discovering how they learn best, students develop into self-directed, resourceful, and skillful learners.

## THE UDL PRINCIPLES*

| | ENGAGEMENT | REPRESENTATION | ACTION & EXPRESSION |
|---|---|---|---|
| **What is it?** | The **WHY** of learning | The **WHAT** of learning | The **HOW** of learning |
| **Why is it important?** | Students differ in **what interests them** and **what motivates them to learn**. | Students differ in how they **perceive and make meaning from information**. | Students differ in how they **navigate learning environments and express what they know**. |
| **What does it look like in practice?** | Students engage in authentic, hands-on learning.<br><br>Learning is relevant to students' identities, personal interests, and career goals.<br><br>Students collaborate, co-create, and build community with peers.<br><br>Students feel safe, included, and welcome.<br><br>Fun and creativity are encouraged. | Course materials are accessible for all learners.<br><br>Multiple media are used to present information.<br><br>Language and symbols are clarified and decoded.<br><br>The curriculum and course materials represent diverse individuals and perspectives.<br><br>Learning is structured to help students build knowledge. | Learning activities and assessments are accessible for all learners.<br><br>Students are guided to organize information, manage time, set goals, and plan their learning.<br><br>Students communicate and express themselves in different ways.<br><br>Students participate in class activities and demonstrate their learning in different ways. |

** Abridged and adapted from the CAST UDL Guidelines.*

# SAMPLE LESSON

Let's look at a sample lesson to see how the general principles described on page 2 can be applied in a CTE classroom.

Examples abridged and adapted from the lesson "Hallucination Detective" by Michael Kingston/AI for Education: https://tinyurl.com/UDLforCTEAI.

Key to abbreviations:
**R = Representation**, **A = Action & Expression**, **E = Engagement**

*Photo: Nassau BOCES*

| ELEMENT | WHY DOES IT WORK? | GO FURTHER WITH UDL |
|---|---|---|
| **Learning goal:** Students will describe ways Gen AI chatbots hallucinate; design a test to demonstrate hallucinations; and identify risks and methods to combat them. | Allows teachers to envision multiple ways students can achieve and demonstrate learning **(A)**. | Share the learning objectives for each lesson with students to **set expectations and short-term goals (A)**.<br><br>Identify the academic, Common Career Technical Core, and cluster-specific industry standards to **illustrate the lesson's relevance** to students' career goals **(E)**. |
| **Hook**<br><br>Students play "Two Truths and a Lie" with a partner then compare human-generated responses to AI-generated responses. | Fun and holds students' attention **(E)**.<br><br>Promotes collaboration and builds community **(E)**.<br><br>Familiar examples support comprehension, transfer, and generalization **(R)**. | "Hallucination Detective" worksheet **keeps students on task** and **helps them organize notes (A)**.<br><br>Whole-class discussion **enhances collaboration (E)** and ensures all students **understand the "big picture" before moving on (R)**.<br><br>As an **alternative to oral participation**, invite students to share responses using a collaborative document or online poll **(A)**. |
| **"Hallucination & the Law" case study**<br><br>Students read a short article and respond to a brief assessment. | Students define terms and express concepts in their own words to improve comprehension **(R)**.<br><br>Scenario-based learning is authentic and relevant to real-world contexts **(E)**.<br><br>Correct answers are discussed to provide immediate feedback **(E)**. | Read the article aloud as a class to **provide an alternative format**. Pause occasionally to **check for comprehension (R)**.<br><br>Share a digital article in advance so students can **preview/review the information (A)** and **customize the display of information (R)**.<br><br>Invite students to complete the worksheet by hand or digitally to offer **options for action and expression (A)**.<br><br>Administer multiple-choice questions as a poll or quiz to **increase interactivity and encourage participation (E)**. |

| ELEMENT | WHY DOES IT WORK? | GO FURTHER WITH UDL |
|---|---|---|
| **Hands-on activity: Hallucination test**<br><br>Students brainstorm questions and answers about a chosen subject to check AI's accuracy. | Tangibly represents course concepts through relatable examples **(R)**.<br><br>Technology and tools are relevant and authentic **(E)**.<br><br>Encourages creativity, evaluation, and critical thinking **(A)**. | Worksheet includes step-by-step instructions and tips to **guide action (A)** and **promote success (E)**.<br><br>Self-selected topics, test formats, and individual or collaborative work **maximize autonomy and choice (E)**. |
| **Presentation to peers**<br><br>Students summarize what they learned in a short presentation for peers. | Offers choice of design tools and formats **(E)**.<br><br>Promotes use of varied tools and methods for composition, communication, and creation **(A)**.<br><br>Presentation template helps students organize information and clarifies expectations **(A)**. | Requiring use of digital technology **builds proficiency with various tools** used widely in education and careers **(A)**.<br><br>Illustrated slide format encourages students to **use multiple media to communicate with diverse audiences (R)**.<br><br>Permit students to work on presentations during class time to **ensure equitable access to technology (R)**.<br><br>Facilitate a peer assessment activity to **gather feedback (E)**, **exercise critical thinking and constructive critique (A)**, and **extend collaborative learning opportunities (E)**. |
| **Closure: Exit ticket**<br><br>Students write two truths and lie about chatbot hallucinations. | Helps students articulate the "big idea" **(R)**.<br><br>Encourages creativity **(E)**.<br><br>Prepares students to transition to their next class or activity **(A)**. | Explain how this lesson will be **relevant to future lessons (E)** to **support planning and goal-setting (A)**.<br><br>Review exit tickets to **identify learning gaps** that should be addressed before introducing the next lesson **(R)**. |

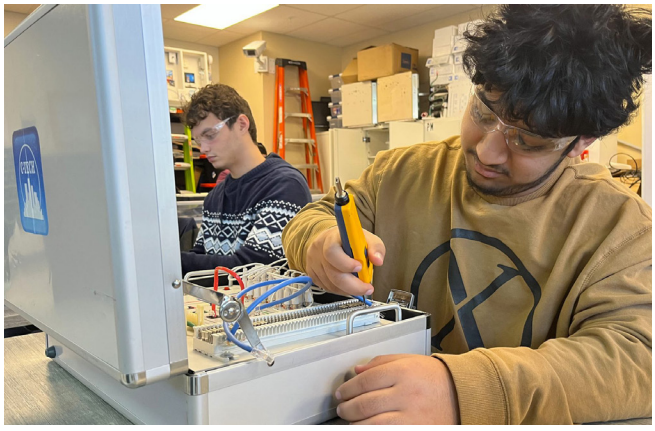

*Photo: Capital Region BOCES*

*Photo: TST BOCES*

# TRY-IT ACTIVITY 1

Apply the framework above to one of the extension activities suggested in the lesson plan or another activity of your choice. Identify examples of UDL principle(s) and/or practices the activity addresses and propose two or three ways you could adapt the activity to go even further with UDL. Refer to the **UDL Principles** in the **Quick Reference Guide** on *page 2* for ideas.

| EXTENSION ACTIVITY (CHOOSE 1) | UDL PRINCIPLES/PRACTICES ADDRESSED | WAYS TO GO FURTHER WITH UDL |
|---|---|---|
| ◯ Guest speaker<br>◯ Research project on other common issues with AI-generated information<br>◯ Create a job aid on "How to Know If Your AI is Hallucinating"<br>◯ Assemble a digital portfolio of coursework<br>◯ Other: | | |

# TRY-IT ACTIVITY 2

How could you make the lesson and/or extension activity more meaningful for the students in *your* CTE Digital Technology course by:

**Tip: Refer to the table on page 6 for information on student demographics and special populations within CTE and CTE Digital Technololgy in New York State.**

**Ensuring students see images and examples of people like themselves working in digital techology?**

**Addressing specific barriers they might encounter (e.g., disabilities, access to resources, language skills)?**

**Making the lesson or activity more relevant to their identities, interests, local context, and/or career goals?**

# WHO ARE OUR STUDENTS IN CTE DIGITAL TECHNOLOGY?

| POPULATION | All U.S. CTE | All NYS CTE | NYS CTE INFORMATION TECHNOLOGY |
|---|---|---|---|
| Female | 46.7% | 42.6% | **25.7%** |
| Nonbinary | *no data* | 0.1% | ***no data*** |
| Students of Color | 51.0% | 59.0% | **76.1%** |
| *American Indian or Alaskan Native* | *0.9%* | *0.8%* | ***1.0%*** |
| *Asian* | *4.6%* | *12.3%* | ***24.3%*** |
| *Black or African American* | *13.1%* | *13.9%* | ***17.2%*** |
| *Hispanic/Latino* | *28.0%* | *29.4%* | ***31.8%*** |
| *Native Hawaiian or Other Pacific Islander* | *0.4%* | *0.3%* | ***0.5%*** |
| *Two or More Races* | *4.0%* | *2.3%* | ***1.5%*** |
| Individuals from Economically Disadvantaged Families | 45.3% | 59.7% | **65.4%** |
| Individuals Preparing for Nontraditional Fields | 24.3% | 18.0% | **13.9%** |
| Individuals With Disabilities (ESEA/IDEA) | 10.7% | 18.6% | **16.8%** |
| Homeless Individuals | 1.4% | 3.5% | **5.2%** |
| English Learners | 5.4% | 3.5% | **4.3%** |
| Youth in Foster Care | 0.2% | 0.2% | **0.2%** |
| Youth With Parent in Active Military | 1.0% | 0.3% | **0.2%** |
| Migrant Students | 0.3% | 0.02% | **0.0%** |

*Sources: PCRN National Enrollment Profile, 2021-22; NYSED Enrollment Data, Secondary CTE Concentrators, 2022-23*

# GUIDED APPLICATION
## GETTING STARTED WITH UDL IN CTE

Implementing UDL doesn't require special pedagogy or training. In fact, you're probably using UDL principles in your teaching without even knowing it! Here are a few ways you can build upon the good teaching you already do.

Complete a printed worksheet by hand or populate a digital copy to share with your principal, consultant teachers, or others who can support your UDL journey. If you share the sheet, don't forget to fill in your information below!

My name:

My CTE program(s) or course(s):

## STRATEGY 1: IDENTIFY OPPORTUNITIES

For ***each*** of the three UDL principles, list one or two examples of strategies you're not currently using in your teaching, but you'd like to learn about or try. Indicate any resources, information, or support you need in order to be successful.

Refer to the **UDL Principles** in the **Quick Reference Guide** on page 2 for ideas.

| ENGAGEMENT | REPRESENTATION | ACTION & EXPRESSION |
|---|---|---|
| *[Example: I want to use polls or games to introduce lessons]* | *[Example: I want to learn how to enable auto-captions in Google Slides]* | *[Example: I want to create graphic organizers to help students take notes]* |
| | | |
| **Resources required:** | **Resources required:** | **Resources required:** |

⚠ **Remember that UDL is not a checklist! You don't need to implement every practice to have a positive impact. Start with one or two small changes. See how they work for you and your students before adding others.**

## STRATEGY 2: THE PLUS ONE (+1) APPROACH

**Plus one (+1)** means adding one option to each resource, activity, or assignment in a lesson or course, as appropriate. Start with options that require a minimal investment of your time and effort to build your momentum.

Choose a specific lesson or learning activity from your course. List each element of the lesson or activity, then propose a +1 for each element. Identify which UDL principle your +1 reflects and briefly explain how that principle is reflected.

*Photo: Nassau BOCES*

**Tip: Refer to the examples in the row What Does It Look Like in Practice? in the table on page 2 to help you explain how your +1 represents one or more UDL principles.**

For example:

- Add a short video to a traditional lecture for **multiple means of representation**.
  ***Bonus:*** *Make sure the video you select has captions or a transcript to double your impact!*
- Allow students to submit a video, podcast, infographic, or other creative product instead of a written essay, lab report, or research paper to provide **multiple means of action and expression**. Or, offer a choice of a multiple-choice quiz or an open-ended essay question to check students' comprehension.
  ***Bonus:*** *Foster critical thinking by inviting students to co-create assignment guidelines and grading criteria, propose quiz questions, and/or participate in peer assessment activities.*
- Offer **multiple means of engagement** by allowing students to choose whether to complete some learning activities individually or in teams. Or, let them choose their own topics and/or formats for assignments.
  ***Bonus:*** *Permitting a choice of formats is a UDL double-dip of boosting engagement AND providing options for action and expression!*

**Lesson or activity title/topic:**

Example: Lesson on career paths within my field of expertise

| WHAT YOU DO NOW | YOUR +1 | WHICH UDL PRINCIPLE(S) DOES YOUR +1 REFLECT? HOW? |
|---|---|---|
| Example: I present a lecture on career options and occupational titles in my field | Example: I will turn on automatic captions during my lecture OR I will share my speaker notes for students to reference as I present | Example: Representation because text is an alternative format for spoken information |
| Example: Students research educational and/or licensing requirements, salary and employment data, and hiring trends in New York State | Example: I will give students the option to complete the assignment individually or with a partner | Example: Engagement because students can collaborate and co-create with peers |
| Example: Students share their research findings with the class as a 5-minute Google Slides presentation | Examples: Students may create and share an infographic, video, or poster instead of slides OR I will provide a slide template students can use for their presentations | Example: Action & Expression because students have options for how they demonstrate their learning OR Action & Expression because a template helps students organize information and allows them to focus on content instead of formatting |