SAMPLE

This sample provides an overview of the content provided through the Neuroinclusive Teaching Institute, including the learning objectives, some introductory material from each section, and links to explore and learn more about neurodiversity. For more information about our faculty development opportunities, please visit: https://neurodiversity.engineering.uconn.edu/neuroinclusive-summer-institute/

Building Neuroinclusive Learning Environments

A Guidebook for STEM Faculty

UCONN

INCLUDE PROGRAM

Include

UNIVERSITY OF CONNECTICUT

neurodiversity.engineering.uconn.edu

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Introduction

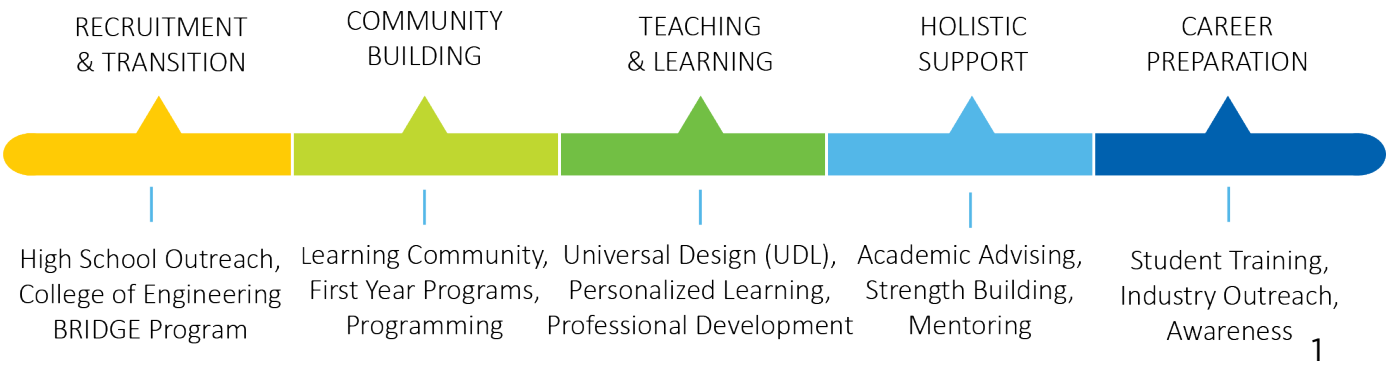
Project Summary

This content was developed as part of the Include project, a 5-year neurodiversity initiative funded by the National Science Foundation IUSE/PFE RED Grant #1920761. The focus of this project is to move beyond the limitations of traditional engineering education by creating a radically inclusive Civil and Environmental Engineering Department that advances personalized learning, increases recruitment and retention of neurodivergent students, improves learning outcomes for all students, and leverages the potential of neurodivergent individuals to contribute to engineering breakthroughs.

The Include team works within the Department of Civil & Environmental Engineering and along with partners across the UConn campus to create an ecosystem that supports diverse learning styles and cultivates the potential of neurodiverse students to contribute to innovations in engineering and beyond.

The Include Program aims to make systemic changes that range across the entire span of an engineering student's undergraduate experience, including:

a) recruitment and transition,
b) community building,
c) teaching and learning,
d) holistic support and advising, and
e) career preparation and industry outreach.



NTSI Overview

The Neuroinclusive Teaching Summer Institute (NTSI) is a day and half workshop that provides insights into the origins of the neurodiversity paradigm and the various theoretical approaches toward neurodiversity. The content is presented from an ecological perspective that emphasizes the ways in which neurodiversity supports the ability of human societies to adapt and thrive in the face of complex challenges.

Practices are anchored in a strengths-based approach to neurodiversity that challenges deficit-based narratives and emphasizes the assets that neurodiverse students bring to the table.

The workshop makes use of a set of inclusive standards that we call the I-Standards. The I-Standards are a faculty-developed framework for neuroinclusive teaching. The workshops provide examples of easy-to-implement practices for the classroom, as well as a deep dive into the benefits and challenges of implementing strengths-based assessments.

Our Mission

The aim of the NTSI is to transform STEM teaching and learning by:

a) encouraging the adoption of a strengths-based approach toward neurodiversity,

b) breaking down stigma and engaging in open dialogue related to neurological variations such as ADHD, autism, and dyslexia, and

c) promoting the implementation of inclusive practices within STEM classrooms in order to build neuroinclusive learning environments in which all students may thrive.

Learning Outcomes (LO)

Participants should be able to:

Part 1 - Neurodiversity	
LO-1a	Explain their understanding(s) of neurodiversity concepts and/or theories. (Understanding)
LO-1b	Identify common strengths and challenges of neurodiverse learners in a higher education context. (Remembering)
LO-1c	Discuss how experiences of neurodiversity may vary across social groups. (Understanding)
Part 2 - A Strengths-based Approach	
LO-2a	Contrast deficit- and strengths-based approaches. (Analyzing)
LO-2b	Apply strengths-based language in a classroom context. (Applying)
LO-2c	Interpret observations through a neurodiversity lens. (Application)
LO-2d	Brainstorm ways to support and empower neurodiverse learners. (Creating)
Part 3 - Neuroinclusive Course Design	
LO-3a	Review a set of standards for neuroinclusive teaching. (Understanding)
LO-3b	Evaluate and revise a course syllabus using standards for inclusive teaching. (Evaluating)
LO-3c	Plan actions in the classroom that empower and engage all students. (Synthesis)
LO-3d	Compose a personalized inclusion statement for use in their course syllabus. (Creating)
Part 4 - Neuroinclusive Teaching Practices	
LO-4a	Give examples of inclusive assessment practices. (Understanding)
LO-4b	Discuss the practical implications of inclusive teaching practices. (Understanding)
LO-4c	Design or revise a course component to support the success of neurodiverse learners. (Creating) (Evaluating)

From the Facilitators:

We value the diversity of thought, experience and perspective brought by members of this neurodiverse learning community. We aim to provide a learning environment in which we work together to co-create knowledge and build on the assets brought by all members of our community. To this end, we take a strengths-based approach and employ neuroinclusive teaching practices, such as:

a) alignment of course objectives, activities, and assessment
b) active learning strategies
c) multiple modes of representation and engagement,
d) flexibility and/or choice within planned activities, and
e) accessible materials in multiple formats.

If you have any concerns, questions, or would like to provide feedback or request further support, please contact us:

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Part 1.
Neurodiversity

Part 1. Neurodiversity

1.1 Summary

This section highlights various neurodiversity approaches, with focus on ecological theory and emphasis on the ways in which neurological diversity may help human societies to adapt and thrive in the face of complex challenges. We discuss differences in brain function, characteristics, strengths and challenges. Participants will recognize strengths and challenges of neurodiverse learners and articulate their understanding of neurodiversity.

1.2 Defining Neurodiversity

Use the blank space to write down your thoughts or sketch some images that represent what neurodiversity means to you.

The concept of **neurodiversity** encompasses a range of natural variations in human populations. Often, neurological variations result in differences in sociability, learning, attention, and mood. How might these variations show up in the classroom?

S	Sociability	
L	Learning	
A	Attention	
M	Mood	

Neurodiversity is frequently used as an **umbrella term** to refer to cognitive variations such as:

- attention deficit hyperactivity disorder (ADHD)
- autism
- dyslexia
- dyscalculia
- developmental coordination disorder (DCD).

Explore: Neurodiversity

Explore a range of audio and video resources to learn more about neurodiversity approaches.

Human Neurodiversity Should Be Celebrated, Not Treated as a Disorder

A brief opinion video from *Now This News* featuring Devon MacEachron, PhD. This provides an engaging summary of the neurodiversity paradigm in contrast with the medical model.

Neurodiversity Podcast

A conversation with Marisa Chrysochoou, Ph.D. and Arash Zaghi, Ph.D. discussing their research and the transformative potential of a strengths-based approach to neurodiversity in STEM. Recorded as part of the Netherlands Dyslexia Week 2022.

Normal Sucks with Jonathan Mooney

A talk with Jonathan Mooney hosted by the UConn Department of Civil and Environmental Engineering Include program. This talk explores issues related to neurodiversity and the traditional education system, empowerment, Universal Design for Learning (UDL), and the need for a paradigm shift in how educators think about neurodiverse students.

Part 2.
A Strengths-Based Approach

Part 2. A Strengths-based Approach

2.1 Summary

This section highlights how a strengths-based approach and using strengths-based language may contribute to an inclusive learning environment for neurodiverse learners. We will practice challenging deficit-based narratives and consider the implementation of strengths-based interventions in teaching to build a culture of inclusion. Participants will brainstorm ways to support and empower neurodiverse learners through a small-group personas/scenarios activity.

A strengths-based approach to neurodiversity:

- Draws on positive psychology
- Supports psychological wellbeing
- Enhances sense of belonging
- Supports motivation
- Increases engagement

Reflection: What are your personal strengths? What are your strengths as an instructor? How do you feel when your strengths are recognized and affirmed?

2.2 Strengths-based Language

The adoption of strengths-based language facilitates the shift to a neurodiversity-oriented approach by emphasizing traits, strengths, and challenges rather than focusing on deficits and impairments.

As you read the statements below, consider the following questions:

- What assumptions are embedded in each of these statements?
- How do these statements contribute to or challenge the stigma related to neurodiversity?
- How do you feel about each statement?

ADHD is characterized by symptoms of inattention, hyperactivity, and impulsivity.

ADHD is characterized by traits including divergent thinking, exploration, and risk-taking.

What neurodiversity-related traits may be considered an asset in STEM fields?

How might students leverage these strengths in STEM fields?

A Few Notes About Language

Language is important. Language can shape the way we see the world and it can also reveal our beliefs and biases. Preferences related to the language around neurodiversity vary widely, and many have strong feelings on the subject. Here are a few thoughts to consider.

Neurodiversity vs. Disability

Neurodiversity refers to the natural neurological variations in human populations. Disability refers to impairments or limitations that restrict participation. Some people identify as both neurodiverse/neurodivergent and as a person with a disability.

Neurodiverse vs. Neurodivergent

Neurodiverse connotes diversity and is generally used to refer to groups. It may be used to refer to individuals, but this does not conform to grammatical conventions. Neurodivergent is the most common and grammatically correct usage. It refers to individuals whose neurology diverges from the “norm.” Our team prefers to use the term neurodiverse, both to emphasize diversity and to push back against rigid conceptions of normality.

Identity-first vs. Person-first

Research shows that within the autism community there is a strong preference for identity-first language (i.e., autistic individuals) rather than person-first language (individual with autism), while service professionals who work with autistic people generally prefer person-first language. Other examples of identity-first language include ADHDer and dyslexic individual. However, language preferences vary from person to person. If you’re not sure what someone’s preference is, it’s okay to ask!

Explore: Autism

Take a deep dive into audio and video resources to learn more about autistic students' experiences in the educational system, as well as the strengths and challenges associated with autism.

Frist Center for Autism and Innovation

A video highlighting how Vanderbilt's Frist Center for Autism and Innovation takes a strengths-based approach toward neurodiversity to conduct groundbreaking research and promote neurodiverse talent in STEM.

Graduate Life on the Spectrum: An Interview with Asia Perkins

A conversation with Asia Perkins, a graduate student pursuing a Ph.D. in clinical psychology. The conversation touches on the theme of building an environment that emphasizes your strengths and mitigates your weaknesses.

Young, Gifted & Black with Autism

A TEDx talk presented by LaChan Hannon about her experiences raising a gifted, Black son with autism. This talk focuses on the impact of racism on her family and their interactions with the education system. Hannon challenges the concept of "normal" and emphasizes the importance of acknowledging families' funds of knowledge.

Part 3.
Neuroinclusive Course Design

Part 3. Neuroinclusive Course Design

3.1 Summary

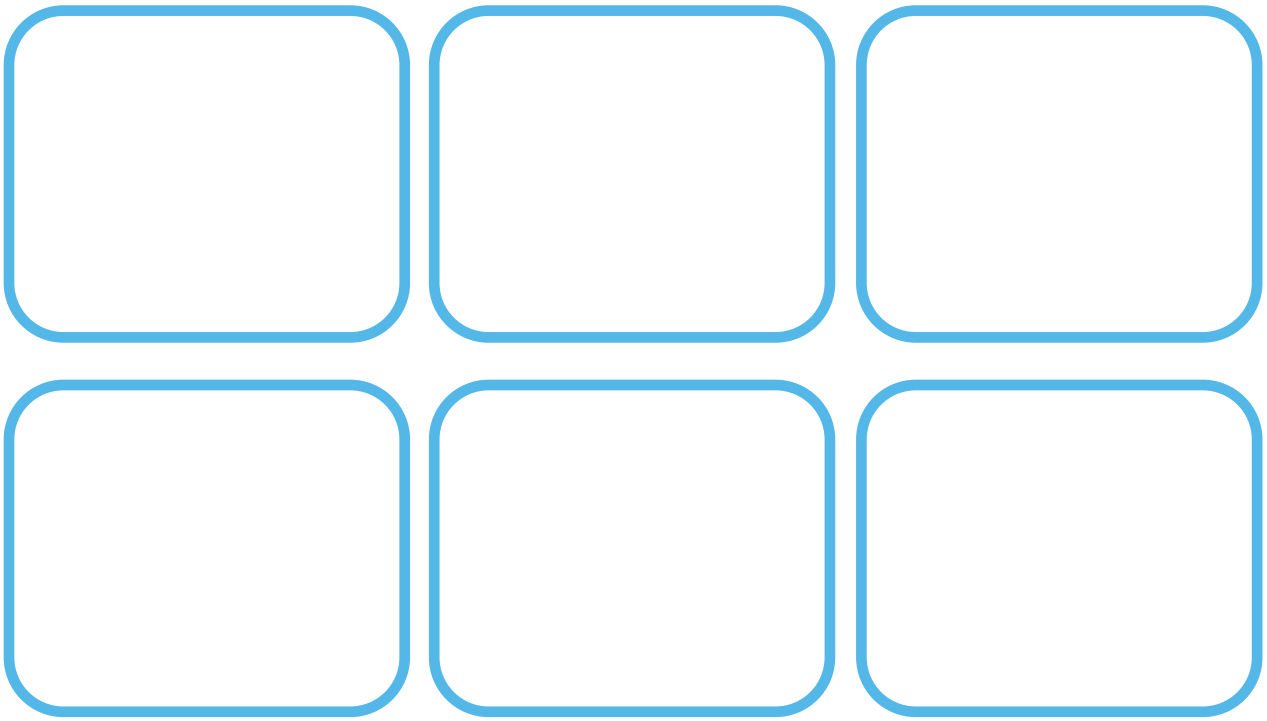
This section highlights a set of faculty-created standards for neuroinclusive teaching and presents key principles for inclusive course design. We discuss how incorporating strengths-based language can contribute to an inclusive learning environment. Participants will prepare a personalized inclusion statement for their course syllabus. Participants will also review a peer's current course syllabus, identifying strengths of the course design and opportunities for revision.

Reflection

What **frameworks** or **principles** guide your course design?

What **inclusive teaching practices** do you already employ?

Key Principles for Inclusive Courses



Reflection: What barriers or challenges do you face related to implementing inclusive course design principles?

3.2 Standards for Neuroinclusive Teaching

These standards were created by UConn CEE faculty as a framework to guide the course redesign process during the summer of 2020, in collaboration with educational design experts and faculty from the Neag School of Education. A strengths-based approach anchors three key components: Culture of Inclusion, Teaching and Learning, and Communication and Supports.

Strengths-based Approach

Studies of strength-based initiatives in higher education settings show that exposure to a strength-based interventions can produce immediate positive short-term effects including increases in confidence, self-efficacy and learning breakthroughs (Louis, 2011). Incorporating awareness of student and faculty strengths into teaching and learning may enhance engagement, motivation, and persistence in the face of challenges (Schreiner, 2014).

Culture of Inclusion

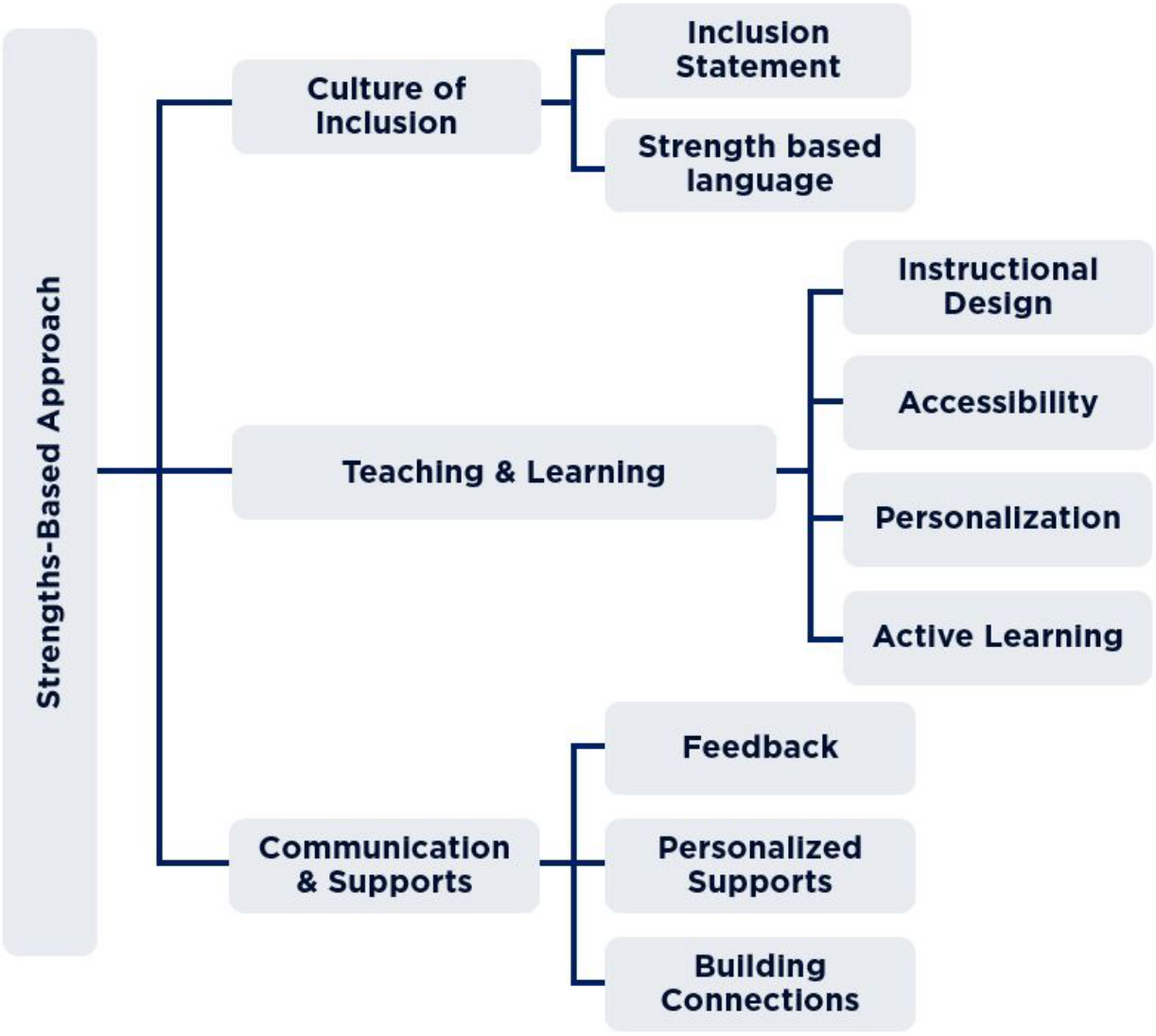
Course instructor builds a culture of inclusion by a) communicating their commitment to inclusion via a written or verbal statement to students, b) learning more about cognitive and other forms of diversity through workshops, readings, or other professional development opportunities, and c) embedding inclusive teaching practices throughout their course.

Teaching and Learning

Course instructor considers ways to personalize the learning environment by a) following principles of Universal Design to make the course accessible to all types of learners b) building in elements of flexibility or choice to meet students' varied learning needs and preferences, and c) providing opportunities for active learning centered around real-world problems.

Communication and Supports

Course instructor enhances student learning, agency, and belonging by a) centering students as stakeholders in the educational experience, b) providing scaffolding and/or other supports for student learning, c) providing multiple modes of feedback to students about their learning and d) building personal connections with students and creating space for students' diverse experiences and identities.



Overview of the I-Standards:
A set of faculty-created standards for neuroinclusive teaching.

Culture of Inclusion

Standards	Rationale	Deliverable
Inclusion Statement(s) 1.1 UConn accessibility statement included in syllabus 1.2 Written personalized inclusion statement included in syllabus and presented in first day of class	Neurodivergent students often feel invisible in the classroom and in the institution overall. The UConn statement anchors the institutional commitment. A personalized inclusion statement highlighted on the first day of classes sets the tone for the instructor's commitment that will be evidenced throughout the course.	Short statement (generally a few sentences to a paragraph in length), provided in the course syllabus. Instructors are encouraged to talk about their statement during the first class.
Faculty Development/ Instructor Training 2.1 Instructor educated him/herself about neurodiversity and strength-based approaches to education, including perusing selected readings provided by INCLUDE project, participating in the I-team workshops and activities, taking CETL inclusion and disability awareness training and other formats chosen by the instructor.	Increased awareness by the instructor on neurodiversity issues is directly tied to both motivation to effect change, increased understanding of the neurodivergent student experience and enhanced ability to meet their needs with pedagogically appropriate interventions.	Active participation in I-team
Adoption of Inclusive Teaching Practices 3.1 Instructor reviews and completes Inclusive Teaching Practices Inventory (provided by CETL). 3.2 Instructor identifies 3-5 "starred" inclusive teaching practices and develops a plan to implement those anchored to a strength-based approach.	This set of evidenced-based best practices addresses the needs of neurodivergent students directly, promotes an inclusive instructor mindset and culture in the classroom and addresses student intersectional identities.	Completed Inventory 1-2 pages implementation plan of starred practices

Teaching and Learning (Universal Design for Learning)

Standards	Rationale	Deliverable
Instructional Design 4.1 Course learning objectives, activities, materials, and assessments are aligned and articulated in a course design plan 4.2 Syllabus includes learning objectives and relationship of activities and assessment to those	Cohesion, consistency and structure are particularly important to minimize the toll on executive function for neurodivergent students	Course Design Plan Syllabus
Accessibility 5.1 Students have access to a document (ideally a live document such as a Google doc) of calendar that is updated every week with actual schedule, changes to any materials/assignments and deadlines. 5.2 All class materials are available in accessible formats to accommodate different learning modes and strengths (i.e., class notes are provided in addition to slides, books with digital editions are chosen for ease of access, videos offer captions) 5.3 Suggested technology to enhance accessibility (speech-to-text, note taking assistance, etc.) is included in syllabus with instructions for access and use– point out during first day of classes	Similarly, importance of structure to support executive function Learners can optimize the mode of interaction with the material based on their preferred mode of intake Minimizes need to multitask during an in-person lectures (i.e. listen and take notes) Empower students to identify and choose the appropriate technology to support their learning	Course schedule Syllabus or Course introduction with description of materials Syllabus with link to page with suggested technologies
Personalization 6.1 Course provides multiple forms of assessment (including exams, quizzes, homework, individual or group projects, term papers, etc.) 6.2 Students have some choice of what assessments they complete or in what format they complete it (e.g., written report, oral presentation, video) 6.3 Faculty guides students through choices and relationship to required skillsets	Different assessment types focus on different skills, beyond the technical knowledge in the course. Choice provides the ability to deliver the same knowledge while tapping to different student strengths and skillsets	Course Design Plan (Assessments)
Active Learning 7.1 Course regularly includes opportunities for in-class active learning	Active learning enhances engagement of all students, and is particularly effective for certain forms of neurodiversity	Examples of active learning exercises from course materials

Communication and Supports

Standards	Rationale	Deliverable
Feedback 8.1 Feedback mechanism in place to collect and incorporate student feedback during the semester (i.e., a class suggestion board or quick survey with sticky notes, Jamboard, mid-semester survey) 8.2 Course includes at least two modes of feedback to the student, such as narrative, oral, or numerical faculty feedback, feedback from TAs, or feedback from peers	Empower students to have agency in the learning process; have mechanism to make improvements during the semester Student-specific feedback, if possible articulating strengths, beyond grades can empower students and enhance their engagement to the course	(Optional) Copy of survey questions
Student Supports 9.1 Faculty provide resources (in groups) for underperforming students (e.g., TA-led special help sessions, UTA-led review sessions, and referrals to CSD/MHW) 9.2 Faculty reach out to underperforming students to provide feedback and advice	Identify the source of student challenges and specific supports that can mitigate those. Personal connection and mentoring can increase student engagement and performance.	None
Connections 10.1 Faculty/Instructors are available for in person and/or online office hours – preferred communications and email turn-around time stated in syllabus for both instructor and TAs 10.2 Faculty will provide at least one opportunity per semester for personal or social connection with and among their students, either in or outside the classroom setting, e.g. via FlipGrid reflections, in class games or discussions, or group projects that include social components	Structure leads to better communication Personal connection and mentoring can increase student engagement Facilitating connections between students creates a support system	Syllabus with communication information

Explore: ADHD

Go down a rabbit hole with these audio and video resources to learn more about experiences of ADHD in the educational system, as well as the strengths and challenges associated with ADHD.

ADHD in Girls and Women

In this TEDx talk, Martha Bernard-Rae shares her lived experiences as a woman who was diagnosed with ADHD late in life. She talks about gender disparities in diagnosis rates, the shame related to internalized negative messages, and her perception of the strengths related to ADHD.

Wild Creativity: A Conversation with Dr. Caitlin O'Brien

A conversation with UConn graduate Caitlin O'Brien exploring the connection between ADHD and creativity, as well as the ways in which cognitive behavioral strategies can reframe intense emotions and challenge negative internal narratives.

Does Having ADHD Make You More Creative?

This video from *How to ADHD* sums up some of Dr. Holly White's research about ADHD and creativity, touching on divergent thinking, strategies for creative work, and barriers that can get in the way.

Part 4.
Neuroinclusive Teaching Practices

Part 4: Neuroinclusive Teaching Practices

4.1 Summary

This section highlights the benefits of active learning in the context of STEM instruction. We provide examples of multiple modes of student interactions and discuss a model to understand different levels of active learning. We consider ways to tailor these strategies with the strengths and challenges of neurodiverse students in mind. Participants will design or revise a course component using neuroinclusive strategies.

Active learning:

- increases student performance in STEM fields
- engages students through discussion or activities
- challenges the passive "banking" model of education
- emphasizes higher-order thinking
- often involves group work

Reflection

How do you incorporate **active learning** into your course?

4.2 Active Learning Basics

Classroom Interactions

S-C	S-T	S-S
Student-Content Interaction	**Student-Teacher Interaction**	**Student-Student Interaction**

Reflection

What types of interactions are most common in your classroom?

Explore: Dyslexia

Looking for an alternative to text? These audio and video resources showcase dyslexic students' experiences in the educational system, as well as the strengths and challenges associated with dyslexia.

Why the dyslexic brain is misunderstood

A video highlighting how recent research has associated dyslexia with cognitive strengths related to visual-spatial processing and creative problem solving. Featuring UConn engineering professor Arash Zaghi.

Overcoming Dyslexia and Anxiety in Engineering: Dr. Lexi Hain's Journey

A conversation with UConn engineering professor Lexi Hain, reflecting on her experiences as a student with dyslexia, both in the K-12 system and as a PhD student pursuing a degree in structural engineering.

In Conversation with Marcia Brissett-Bailey: How to Ensure Neurodiverse Children Do Not Miss Out

A conversation touching on the intersection between neurodiversity and race, with Marcia Brissett-Bailey, co-founder of the British Dyslexia Association Cultural Perspective Committee.

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