Incorporating Universal Design for Learning (UDL) in the Course Outline of Record (COR)

UDL centers on three core principles: Engagement, Representation, and Action and Expression. See the Infographic or visit the CAST website for more information.

UDL should be incorporated into the COR through the Methods of Instruction, Online Adaptation and Methods of Evaluation sections. Each area needs two examples that are course specific. Examples can be found below or in the ASCCC Course Outline of Record Guide.

Title V requires that all courses have two course specific reading, writing and outside-of-class assignments.

A summary of each of the three core principles can be found after the examples.

Objectives used for examples:
Perform calculations with place value systems.
Evaluate the equivalence of numeric algorithms and explain the advantages and disadvantages of equivalent algorithms in different circumstances.
Apply algorithms from number theory to determine divisibility in a variety of settings.

COR UDL Incorporation Examples

Methods of Instruction
Type: Lecture
Examples of Learning Activities: Instructor demonstrates addition, subtraction, and regrouping in base-ten and alternate bases using symbolic notation, manipulatives, visual place charts, and verbal explanation so students can perform calculations with place value systems while accessing the concept through multiple representations.

Type: Discussion
Examples of Learning Activities: Instructor facilitates guided whole-class discussions in which students explain divisibility reasoning and justify why rules work so students can apply number-theory algorithms for divisibility while expressing reasoning verbally, visually, or symbolically, supporting multiple communication pathways.

Type: Activity
Examples of Learning Activities: Students work in small groups using manipulatives, drawings, symbolic work, or digital tools to solve alternate-base arithmetic problems so they can perform place-value calculations while selecting among multiple modeling approaches, supporting student autonomy and varied action methods.

Online Adaptation

Type: Lecture
Examples of Learning Activities: Instructor provides captioned video lectures demonstrating regrouping and positional notation in base-ten and alternate bases using annotated slides, manipulatives shown on camera, and written symbolic work so students can perform calculations with place value systems while accessing concepts through multiple visual, verbal, and symbolic representations supporting multiple ways to perceive information.

Type: Discussion
Examples of Learning Activities: Instructor facilitates asynchronous discussion boards where students post written, audio, or video explanations of divisibility reasoning and respond to peers so they can apply number-theory algorithms for divisibility while using varied communication modes supporting expression flexibility.

Type: Activity
Examples of Learning Activities: Students complete scaffolded digital problem sets involving alternate-base arithmetic using virtual whiteboards, symbolic work, or uploaded handwritten solutions so they can perform place-value calculations while selecting preferred solution formats consistent with autonomy and varied response methods.

Type: Group Work
Examples of Learning Activities: Students collaborate in breakout rooms or shared documents to compare worked examples of different computational algorithms and jointly prepare visual summaries so they can evaluate equivalent numeric algorithms while constructing knowledge collaboratively and using shared visual, written, or presentation formats consistent with engagement and communication supports.

Methods of Evaluation
Type: Exams/Tests
Examples of classroom assessments: Exams require students to perform calculations in place value systems including base-ten and alternate-base operations, demonstrating regrouping and positional notation through symbolic solutions, written reasoning, annotated diagrams, or structured mathematical explanations, supporting multiple modes of expression.

Type: Projects
Examples of classroom assessments: Mathematical modeling projects require students to represent rational numbers using ratio, fraction, decimal, and number-line models and analyze the arithmetic procedures for each representation. Projects may be submitted in written, presentation, visual, or multimedia formats so students can communicate mathematical reasoning using multiple media.

Type: Class Participation

Examples of classroom assessments: Students participate in structured mathematical discussions where they explain equivalence among numeric algorithms and evaluate when different solution strategies are appropriate. Participation may occur through verbal discussion, written contributions, shared board work, or digital response formats, supporting flexible interaction pathways

Title V Required Assignment Examples

Assignments

Reading Assignments:

Example 1: Students read assigned sections of *Math for Educators* addressing topics such as positional notation, alternate bases, and standard computational algorithms prior to class instruction.

Example 2: Students read textbook sections covering rational number representations, divisibility rules, least common multiples, greatest common divisors, and the classification of real numbers. These readings include extended worked examples, proofs or justifications of rules, and conceptual explanations connecting procedures to mathematical structure.

Writing Assignments:

Example 1: Students write a 1-2 page mathematical explanation describing the reasoning behind a selected computational algorithm (for example, regrouping in base ten, fraction multiplication, or a divisibility rule). The writing must clearly explain the conceptual basis of the procedure, use correct mathematical terminology, and include symbolic examples demonstrating the explanation.

Example 2: Students prepare a 2-3 page written analysis explaining how a mathematical concept such as rational number equivalence, place value structure, or number classification could be taught conceptually to elementary students. The response must include a clear explanation of the mathematics, discussion of potential student misconceptions, and description of instructional approaches supporting conceptual understanding.

Outside-of-Class Assignments:

Example 1: Students complete assigned problem sets outside of class involving computations in alternate bases, application of divisibility rules, determination of least common multiples and greatest common divisors, rational number operations, and classification of numbers within the real number system. These assignments require multi-step reasoning, symbolic computation, and interpretation of mathematical structure. Problems progress from guided practice to more complex applications requiring independent solution strategies.

Example 2: Students complete extended outside-of-class assignments requiring development of elementary-level mathematical activities, conceptual models, or structured solution explanations for selected topics such as place value, fraction representations, or number system relationships. These assignments require students to synthesize course concepts, organize mathematical reasoning clearly, and prepare materials suitable for instructional use or demonstration.

Summary of Core UDL Principles

Engagement

- Use a collaborative approach among learners and educators to co-design learning goals, activities, and tasks.
- Offer options with varying modes of complexity or difficulty.
- Encourage and support opportunities for peer interactions and supports (e.g., peer tutors).
- Construct communities of learners engaged in common interests or activities or who identify in similar ways.
- Construct communities of learners engaged in differing interests or activities or who identify in differing ways.
- Offer feedback that encourages perseverance, focuses on development of efficacy and self-awareness, and encourages the use of specific supports and strategies in the face of challenge.
- Offer feedback that emphasizes effort, improvement, and achieving a goal rather than on relative performance.
- Offer feedback that is frequent, timely, and specific.
- Offer feedback that is substantive and informative rather than comparative or competitive.
- Offer feedback that models how to incorporate reflection, including identifying patterns of challenges or strengths, into positive strategies for future success.
- Offer feedback that encourages risk taking and offers another (or differing) perspective(s).
- Support activities that encourage self-reflection and appreciation of one's strengths in order to build confidence.
- Create opportunities for learners to appreciate their personal, cultural, and linguistic assets and the assets of others (e.g., displaying learner-created self-portraits, creating spaces for affinity groups, sharing notes of appreciation with peers and colleagues).
- Use activities that include a means by which learners get feedback and have access to alternative scaffolds (e.g., charts, templates, feedback displays) that support understanding progress in a manner that is understandable and timely.

Representation

- Incorporate a range of authors with various identities, including (but not limited to) gender, race, different abilities, nationality, and socio-economic background.

- Allow for flexibility and easy access to multiple representations of notation where appropriate (e.g., formulas, word problems, graphs).
- Offer a diverse curriculum with a variety of literary works, historical perspectives, and cultural practices from various linguistic backgrounds.
- Make all key information in the dominant language also available in home or heritage languages.
- Avoid using ableist language (expressions that use terms associated with disabilities as pejoratives).
- Avoid using language and symbols associated with oppression, discrimination, or dehumanization.
- Present key concepts beyond representation via text (e.g., an expository text or a math equation) with another or multiple formats (e.g., an illustration, dance/movement, diagram, table, model, video, comic strip, storyboard, photograph, animation, or physical or virtual manipulative).
- Incorporate multiple ways of knowing, including storytelling, kinesthetics, problem solving, and relational learning through interpersonal experiences.
- Use checklists, organizers, sticky notes, and electronic reminders.
- Use templates, graphic organizers, and concept maps to support note-taking.

<u>Action & Expression</u>

- Embed flexibility in the requirements for rate, timing, speed, and range of motor action required to interact with instructional materials, physical manipulatives, and technologies.
- Offer options for physically responding or indicating selections (e.g., alternatives to marking with pen and pencil, alternatives to mouse control).
- Select software that works seamlessly with keyboard alternatives.
- Use physical manipulatives (e.g., building blocks, 3D models, base-10 blocks).
- Solve problems using a variety of strategies.
- Use calculators, graphing calculators, geometric sketch pads, or pre-formatted graph paper.
- Use Computer-Aided-Design (CAD), music notation (writing) software, or mathematical notation software.
- Use web applications (e.g., collaborative applications, animation, presentation).
- Use differentiated feedback (e.g., feedback that is accessible because it can be customized to individual learners).
- Use differentiated models of self-assessment strategies (e.g., role-playing, video reviews, peer feedback).