# Inclusive Design and Accessibility

A fundamental principle of effective microcredential course design is meeting your learners where they are. One way to reach our audience where they are is to use the principles of Universal Design for Learning (UDL) when developing microcredential courses.

## 1. Universal Design for Learning

UDL offers a set of principles for curriculum development that gives all individuals equal opportunities to learn. UDL provides a blueprint for creating instructional goals, methods, materials, and assessments that work for everyone. It is not a single, one-size-fits-all solution but rather flexible approaches that can be customized and adjusted for individual needs.

UDL principles can be applied to the overall design of a course and the specific instructional materials and strategies such as lectures, learning activities, learning resources, assignments, online instruction, and demonstrations. The goal is to provide learners with multiple or flexible ways of viewing or listening to information (representation), expression, and engagement, making a learning experience more inclusive and reducing the need for special accommodations for learners with disabilities.

## 2. UDL principles and checklists

This section provides a brief description of each primary UDL principle. Each description is followed by a checklist containing all the principles and checkpoints, accompanied by examples of how the principles can be applied in microcredential design and course delivery.

It is important to note that an inclusive and accessible microcredential course in compliance with AODA legislation does not necessarily mean that the designer should put a checkmark on each checkpoint in the checklists. The listed checkpoints are merely items to consider in order to increase the inclusivity and accessibility of the course. Which checkpoints or principles are relevant is subject to the specific contexts in which the courses are embedded.

### Provide multiple means of engagement

Learners can learn effectively with high motivation if they actively engage in the learning process. However, as they are from various backgrounds, there is significant variation in their learning preferences and ways to engage in the learning process. For example, some learners thrive when learning independently, while others are most engaged when working collaboratively with their peers. One implication is that course designers should create opportunities for learners to access and engage in the learning process in multiple ways. A question guiding the application of this principle is: are learners challenged, excited, and motivated about what they are learning in the course?

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| Provide multiple means of engagement | |
| Provide options for recruiting interests | Example |
| Optimize individual choice and autonomy | Provide alternative assessment options for learners to choose the one that helps them best demonstrate their mastery of the targeted competency |
| Optimize relevance, value, and authenticity | Use real-life examples to present how learners can apply the skills in their daily lives |
| Minimize threats and distractions | Select materials without introducing biases against any groups of learners (e.g., age, gender, race, sexuality) |
| Provide options for sustaining effort and persistence | Example |
| Heighten salience of goals and objectives | Divide the learning objective into smaller learning goals and explain how they build up the targeted competency |
| Vary demands and resources to optimize challenge | Give learners alternative tools and resources to complete a course project |
| Foster collaboration and community | Create flexible grouping options (e.g., learning pairs, breakout room groups, project teams) that facilitate peer cooperation |
| Increase mastery-oriented feedback | Give learners frequent and constructive feedback that supports mastery of the competency |
| Provide options for  self-regulation | Example |
| Promote expectations and beliefs that optimize motivation | Facilitate self-reflection activities (e.g., self-reflection paper) that help learners identify personal learning goals and their connections with the course |
| Facilitate personal coping skills and strategies | Provide feedback and support for learners in handling challenges encountered throughout the course |
| Develop self-assessment and reflection | Create templates for learners to track their learning progress |
| Resources | |
| **UDL guidelines**   * [Provide options for recruiting interests](https://udlguidelines.cast.org/engagement/recruiting-interest) * [Provide options for sustaining effort and persistence](https://udlguidelines.cast.org/engagement/effort-persistence) * [Provide options for self-regulation](https://udlguidelines.cast.org/engagement/self-regulation)   **Examples/techniques of multiple means of engagement**   * [Principle III: Provide multiple means of engagement](https://www.mcgill.ca/access-achieve/faculty-staff/resources/udl-videos) * [UDL and assessment](http://udloncampus.cast.org/page/assessment_udl#l1970374): provide multiple means of engagement section * [Inclusive strategies](https://publications.ici.umn.edu/ties/5-15-45/resources/list-of-inclusive-strategies) (Include both tips and examples)   **Providing effective feedback**   * [Gathering formative feedback with mid-course evaluations](https://teaching.utoronto.ca/resources/gathering-formative-feedback-with-mid-course-evaluations/) * [Assessing online learning](https://teaching.utoronto.ca/resources/assessing-online-learning/) * [Impact of performance feedback for effective use of digital badges](https://files.eric.ed.gov/fulltext/EJ1255355.pdf) (Please refer to table 2 and section 4.2) | |

### Provide multiple means of representation

Learners perceive and comprehend information presented in the courses differently. Many factors have contributed to such variation, such as cultural differences and learning disabilities. In addition, learners may also have varied learning styles. For example, some learners understand the information faster when they have opportunities to engage in visual materials (e.g., images and video clips). As learners enrolling in the microcredential courses may come from diverse backgrounds and have different learning preferences, course designers should provide multiple options to present the course materials to satisfy learners’ needs. One question the course designers should consider is: are the course materials and contents presented in multiple ways?

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| Provide multiple means of representation | |
| Provide options for  perception | Example |
| Offer ways of customizing the display of information | Pay attention to information display (e.g., font size, color, sound volume, visual layout) |
| Offer alternatives for auditory information | Use the closed captioning function and provide a written transcript for Zoom |
| Offer alternatives for visual information | Create a screencast explaining an assignment in addition to a text description |
| Provide options for  language & symbols | Example |
| Clarify vocabulary and symbols | Add support for vocabulary and symbols within the text (e.g., hyperlinks or footnotes to definitions, explanations, illustrations, previous coverage, and translations) |
| Clarify syntax and structure | Use a concept map to explain and connect the unfamiliar concepts |
| Support decoding of text, mathematical notation, and symbols | Allow the use of Text-to-Speech |
| Promote understanding across languages | Provide translation tools (e.g., DeepL) for learners to refer to on critical concepts |
| Illustrate through multiple media | Display information in multiple formats, such as lecture, text, graphics, audio, video, hands-on exercises |
| Provide options for  comprehension | Example |
| Activate or supply background knowledge | Use examples, analogies, and metaphors to connect the concepts with learners’ existing knowledge |
| Highlight patterns, critical features, big ideas, and relationships | Provide multiple examples and practice opportunities (e.g., assignments) to draw learners’ attention to the critical skills to master at each stage |
| Guide information processing and visualization | Chunk the content into smaller components and release them progressively |
| Maximize transfer and generalization | Design multiple opportunities (e.g., practice sets, projects, feedback) for learners to practice and apply the targeted competency |
| Resources | |
| **UDL guidelines**   * [Provide options for perception](https://udlguidelines.cast.org/representation/perception) * [Provide options for language & symbols](https://udlguidelines.cast.org/representation/language-symbols) * [Provide options for comprehension](https://udlguidelines.cast.org/representation/comprehension)   **Web Accessibility**   * [Quick reference to the web content accessibility guideline (WCAG) requirements and techniques](https://www.w3.org/WAI/WCAG21/quickref/?versions=2.0) * [World wide web consortium web accessibility initiative](https://www.w3.org/WAI/) * [EASI – Equal access to software and information](http://easi.cc/) (Learners with disability to gain equal access to the information technology)   **Accessibility support resources**   * [PowerPoint accessibility: Add an alternative text label](https://webaim.org/techniques/powerpoint/#alttext) (With examples) * [Best practices and how-tos: Steps to inclusive content](https://www.chhs.colostate.edu/accessibility/best-practices-how-tos/)   **Web accessibility tools**   * [WAVE web accessibility evaluation tools](https://wave.webaim.org/) * [14 Brilliant Tools for Evaluating Your Design’s Colors](https://www.webfx.com/blog/web-design/14-brilliant-tools-for-evaluating-your-designs-colors/) * [Image analyzer](https://juicystudio.com/services/image.php)   + This website examines the accessibility of all images of a website * [NVDA (NonVisual Desktop Access)](https://www.nvaccess.org/)   + Free screen reader * [Types of alternative formats](https://snow.idrc.ocadu.ca/4b-0-alternative-formats/what-are-alternative-formats/)   **Third-party services**   * [WebAIM](https://webaim.org/)   **Other resources**   * [20 tips for teaching an accessible online course](https://www.washington.edu/doit/20-tips-teaching-accessible-online-course) * [A quick checklist and tips from Queensland VET Development Centre](https://utoronto.sharepoint.com/:b:/s/001T_ITSOLSProjects/EXYqAMwenhdHqSMzR1O6RR0B8TakSRbDtxp6QW9NrJo2Xw?e=e2p55k) * [Principle I: provide multiple means of representation](https://www.mcgill.ca/access-achieve/faculty-staff/resources/udl-videos) * [UDL and assessment](http://udloncampus.cast.org/page/assessment_udl#l1970374): Provide multiple means of representation | |

### Provide multiple means of action and expression

Learners have varied preferences in demonstrating what they have learned. Due to various factors (e.g., language barriers), they may approach the assignments and tasks in the course differently. In addition, learners may also have diverse preferences in expressing and demonstrating their learning progress and achievement. For example, some may be competent in oral communication and thus can better indicate their understanding of the content through oral presentations. In other words, no universal method works effectively for all learners. Thus, the course designers should provide multiple and diverse opportunities for learners to express their learning outcomes and take the initiative. This is especially important in a microcredential context, as learners expect multiple opportunities to practice and demonstrate mastery of the targeted competence. Course designers should ask themselves, are learners provided sufficient and different opportunities to demonstrate their learning outcomes?

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| Provide multiple means of action & expression | |
| Provide options for physical action | Example |
| Vary the methods for response and navigation | Provide alternatives for learners to interact with instructional materials (e.g., writing, drawing, dictating) |
| Optimize access to tools and assistive technologies | Provide alternate keyboard commands for mouse action |
| Provide options for  expression & communication | Example |
| Use multiple media for communication | Adopt social media and interactive communication tools (e.g., storyboard, forum posting) |
| Use multiple tools for construction and composition | Introduce learners to software and applications (e.g., mathematical notation, grammar check) that can support the learning process |
| Build fluencies with graduated levels of support for practice and performance | Provide multiple mentors (e.g., peer, TA, instructor, and partner employers) who use different approaches to support the learning process |
| Provide options for  executive functions | Example |
| Guide appropriate goal setting | Display examples of the process and products of goal settings from learners in the previous cohorts |
| Support planning and strategy development | Design multiple checkpoints for learners to “stop and think” before taking actions |
| Facilitate managing information and resources | Provide a checklist (e.g., a question list) to guide learners through resources navigation |
| Enhance capacity for monitoring progress | Create assessments that support learners to demonstrate their skill mastery at different stages (e.g., portfolio building) |
| Resources | |
| **UDL guidelines**   * [Provide options for physical action](https://udlguidelines.cast.org/action-expression/physical-action) * [Provide options for expression & communication](https://udlguidelines.cast.org/action-expression/expression-communication) * [Provide options for executive functions](https://udlguidelines.cast.org/action-expression/executive-functions/executive-functions)   **Additional tools to support communication**   * [Ghotit](https://www.ghotit.com/) (Dyslexia writing & reading assistant) * [Text-to-speech](https://text-to-speech.imtranslator.net/speech.asp) * [Uoft tool finder](https://teaching.utoronto.ca/resources/tool-guide-menu/) (“Collaborate”, “Communicate, “Create Media”, and “Discuss” tabs)   **Other tools**   * [Grammatical support tools](https://snow.idrc.ocadu.ca/resources/grammatical-support-tools/)   **Other resources**   * [Principle II: provide multiple means of action and expression](https://www.mcgill.ca/access-achieve/) * [UDL and assessment](http://udloncampus.cast.org/page/assessment_udl#l1970374): Provide multiple means of action & expression | |

## 3. Other resources

### Policy related resources

[Materials for accessible communication](https://people.utoronto.ca/inclusion/accessibility/resources/) (As of January 1st, 2021, under the AODA, all public sector organizations must ensure their Internet websites and web content adhere to Level AA standards defined by the World Wide Web Consortium Web Content Accessibility Guidelines (WCAG) 2.0. This website provides resources and further information for readers to ensure that their communication initiatives comply with the new requirements)

### Other UDL resources

[CAST online tools](https://www.cast.org/products-services/online-tools) (CAST provided a wide range of online tools, many of which are free of charge, to educators who intend to apply UDL principles to increase accessibility and inclusivity of their courses)

[Educator’s accessibility toolkit](https://accessiblecampus.ca/tools-resources/educators-tool-kit/) (This toolkit provides tips and best practices to make courses accessible and inclusive to all learners; the recommendations in the toolkit cover all UDL principles)

[Examples in higher education](http://udloncampus.cast.org/page/udl_examples) (Examples of how the UDL principles can be applied to increase the inclusivity of teaching)

[Introduction to accessible education](https://accessiblecampus.ca/tools-resources/educators-tool-kit/introduction-accessible-education/) (a general introduction to accessible education)

[Mobile accessibility resources](https://snow.idrc.ocadu.ca/resources/mobile-accessibility-resources/) (This page displays a list of supportive software, applications, and tools for increasing the accessibility of the course content on mobile devices)

[Real connections: making distance learning accessible to everyone](https://www.washington.edu/doit/real-connections-making-distance-learning-accessible-everyone) (This article presents typical access barriers learners may face and recommendations for making the course more accessible)

[SNOW Inclusive learning and education](https://snow.idrc.ocadu.ca/) (This website provides a wide range of resources and tips on making classroom and course content accessible and inclusive to all learners)

[Universal Design of Instruction (UDI): Definition, Principles, Guidelines, and Examples](https://www.washington.edu/doit/universal-design-instruction-udi-definition-principles-guidelines-and-examples) (Combined UDL and WCAG guidelines)