



California Open Online Library for Education & Accessibility

COOL4Ed (the California Open Online Library for Education) was created so that faculty can easily find, adopt, utilize, review and/or modify free and open etextbooks for little or no cost. The COOL4Ed accessibility open textbook evaluations can inform faculty, staff, and students how the free and open etextbooks meet 15 accessibility “checkpoints” that could impact the learning of learners with a range of disabilities.

SUMMARY OF ACCESSIBILITY EVALUATION:

Textbook: Information Systems
Format of Textbook: PDF

Assistive Technology (AT) Evaluation Score: Overall	6.8 (Maximum score = 10)
<p>Assistive Technologies (AT) Evaluations applies specialized tools and software in the accessibility evaluation process. These specialized assistive technologies, see list below, are typically not used or available by the general public into the accessibility evaluation process.</p> <ul style="list-style-type: none"> • Accessibility features of desktop operating systems (e.g. high-contrast display themes, settings from the Keyboard and Mouse control panels) • Accessibility-related software included with desktop operating systems (e.g. VoiceOver, Microsoft Narrator) • Third-party accessibility software and hardware: • Screen readers (e.g. JAWS, Window Eyes) • Magnification software (e.g. ZoomText Magnifier/Reader, MAGIC Pro with Speech) • Reading software for users with learning disabilities (e.g. Read and Write Gold, Kurzweil 3000) • Refreshable Braille displays 	
Non- Assistive Technology (NAT) Evaluation Score: Overall	6.1 (Maximum score =10)
<p>Non-Assistive Technologies (NAT) Evaluations applies only native or basic tools and software such as the keyboard and Narrator in the accessibility evaluation process. These non-assistive technologies are readily available and used by the general public.</p>	



COOL4Ed Accessibility Evaluation Methods:

The California State University [Accessible Technology Initiative](#) and [MERLOT](#) (Multimedia Educational Resources for Learning and Online Teaching) developed the rubric or “checkpoints” for the accessibility evaluation. [CAST](#), a nationally recognized organization with expertise in accessibility and UDL, reviewed and affirmed the appropriateness and value of the accessibility evaluation rubric and contributed the references and support resources to help people learn how best to design, evaluate, and remediate the learning materials to maximize the accessibility of the learning resources for all. The “checkpoints” have been built upon the Section 508 technical standards and has been organized and tailored to the typical characteristics of digital resources used in higher education courses.

The accessibility evaluations were performed by the [Center for Usability in Design and Accessibility](#) at California State University, Long Beach; faculty and graduate students with expertise in human factors, usability, and accessibility performed the evaluations of over 150 free and open etextbooks. COOL4ed.org has published the accessibility evaluation rubric and provides a detailed description of the methodology used to evaluate the accessibility of the etextbooks in COOL4ed.

LOOKING FOR DETAILED ACCESSIBILITY REPORTS?

[See Detailed Accessibility Evaluation Report using Assistive Technologies](#)

[See Detailed Accessibility Evaluation Report using Non-Assistive Technologies](#)



DETAILED ACCESSIBILITY EVALUATION REPORT using Assistive Technologies

Assistive Technologies (AT) Evaluations applies specialized tools and software in the accessibility evaluation process. These specialized assistive technologies, such as Kurzweil and NVDA, are typically not used or available by the general public into the accessibility evaluation process.

1. Accessibility Documentation

A. The organization providing the online materials has a formal accessibility policy.	Fail
Additional Information:	Did not find any information about Merlot's formal accessibility policy.
B. The organization providing the online materials has an accessibility statement.	Fail
Additional Information:	Did not find any information about Merlot's accessibility statement.
C. An Accessibility Evaluation Report is available from an external organization.	Fail
Additional Information:	Did not find any information about Merlot's accessibility evaluation report.

2. Text Access

A. The text of the digital resource is available to assistive technology that allows the user to enable text-to-speech (TTS) functionality.	Pass
Additional Information:	5/5 pages had proper text to speech capabilities (Pg. 6, 22, 105, 163, 244). Although images were skipped, all normal text was read aloud and easy for the user to follow along with the NVDA reader.

3. Text Adjustment

A. Text is compatible with assistive technology.	Pass
Additional Information:	5/5 pages were able to properly zoom in and out (Pg. 6, 22, 105, 163, 244). However, in order to read all of



	the content on the page the reader has to horizontally scroll.
B. The resource allows the user to adjust the font size and font/background color (or is rendered by an application such as a browser, media player, or reader) that offers this functionality).	Pass
Additional Information:	5/5 pages had normal text that was able to adjust font and background colors (Pg. 6, 22, 105, 163, 244). However, headers, links, and images did not change colors when adjusted.

4. Reading Layout

A. Text of the digital resource is compatible with assistive technology that allows the user to reflow the text by specifying the margins and line spacing (or is rendered by an application such as a browser, media player, or reader that offers this functionality).	Pass
Additional Information:	5/5 pages had proper reflow of text (Pg. 6, 22, 105, 163, 244). However, it only had proper reflow of text because the reflow of the text did not adjust while zooming in and out on the content.
B. If the digital resource is an electronic alternative to printed materials, the page numbers correspond to the printed material.	N/A
Additional Information:	No printed version available.

5. Reading Order

A. The reading order for digital resource content logically corresponds to the visual layout of the page when rendered by assistive technology.	Pass
Additional Information:	5/5 pages had proper reading order (Pg. 6, 22, 105, 163, 244). Although images were skipped, all normal text was read aloud and easy for the user to follow



	along with the NVDA reader. Despite images being skipped, the content was still read in a logical order.
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6. Structural Markup/Navigation

A. The text of the digital resource includes markup (e.g. tags or styles) that allows for navigation by key structural elements (chapters, headings, pages) using assistive technology (or is rendered by an application such as a browser, media player, or reader that offers this functionality).	Fail
Additional Information:	0/12 pages had proper navigation of text (Pg. 6, 8, 10, 12, 18, 20, 22, 23, 31, 32, 60, 244). Headers, lists, and items were not navigable using the NVDA hotkeys. They were not found.
B. The text of the digital resource includes markup for bullets and numbered lists that is compatible with assistive technology (or is rendered by an application such as a browser, media player, or reader that offers this functionality).	Fail
Additional Information:	0/10 lists were properly navigable using the NVDA hotkeys (Pg. 6, 12, 18, 48, 50, 56, 113, 115, 118, 205). When the NVDA reader was reading the content aloud, the NVDA reader would state "no list found."
C. If the text of the digital resource is delivered within an ebook reader application, a method is provided that allows users to bypass the reader interface and move directly to the text content that is compatible with assistive technology.	N/A
Additional Information:	No eReader application.

7. Tables

A. Data tables include markup (e.g. tags or styles) that identifies row and column headers	Fail
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<p>in a manner that is compatible with assistive technology (or are rendered by an application such as a browser, media player, or reader that offers this functionality).</p>	
<p>Additional Information:</p>	<p>1/10 tables had proper table markup and was navigable using the NVDA hotkeys (Pg. 105). The remaining 9 tables were either skipped because it was a figure, read line by line rather than cell by cell, and were skipped because they were labeled as graphics (Pg. 47, 61, 83, 107, 118, 153, 154, 155, 156).</p>

8. *Hyperlinks*

<p>A. In-book links take you to a location within the textbook. For example, the table of contents would be considered in-book links and embedded links take you to the correct location in the book.</p>	<p>Pass</p>
<p>Additional Information:</p>	<p>30/30 within book hyperlinks were properly functioning (Pg. 3, 100-106, 118-123).</p>
<p>B. Live hyperlinks take you to any website or webpages external to the book.</p>	<p>Fail</p>
<p>Additional Information:</p>	<p>14/20 live hyperlinks were properly functioning and took the user to proper websites online (Pg. 2-6, 104-106, 117-118, 166-195, 201-207). 5/20 live hyperlinks had proper description (Pg. 2-6, 106, 201). The remaining 15 hyperlinks were all labeled as URLs (Pg. 2, 104-118, 166-195, 204-207).</p>
<p>C. Live links take you to the correct webpage that is functioning properly.</p>	<p>Pass</p>
<p>Additional Information:</p>	<p>14/20 live hyperlinks were properly functioning and took the user to proper websites online (Pg. 2-6, 104-106, 117-118, 166-195, 201-207).</p>
<p>D. Live links are descriptive enough for the users to know where it should take them.</p>	<p>Fail</p>



Additional Information:	5/20 live hyperlinks had proper description (Pg. 2-6, 106, 201). The remaining 15 hyperlinks were all labeled as URLs (Pg. 2, 104-118, 166-195, 204-207).
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9. Color and Contrast

A. All information within the material that is conveyed using color is also available in a manner that is compatible with those that do not perceive color, and information conveyed by color is also conveyed in other ways.	Pass
Additional Information:	12/12 pages had consistent color redundancy (Pg. 6, 8, 10, 12, 18, 20, 22, 23, 31, 32, 60, 244). Headers and links were consistently blue and normal text was consistently black.
B. Information is conveyed from the sub-categories for contrast.	Pass
Additional Information:	Headers were dark blue against a white background. Text was black against a white background.
C. Contrast for headers passed WCAG AA standards for large texts (contrast ratio 3:1).	Pass
Additional Information:	Headers were dark blue against a white background.
D. Contrast for text passed WCAG AA standards for normal texts (contrast ratio of 4.5:1).	Pass
Additional Information:	Text was black against a white background.
E. Contrast for simple images (for example, images of atoms) passed WCAG AA standards (contrast ratio of 4.5:1).	N/A
Additional Information:	No simple images found.

10. Language

A. The text of the digital resource includes markup that declares the language of the content in a manner that is compatible with assistive technology.	N/A
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Additional Information:	Do not have Adobe Pro/Complete version.
B. If the digital resource includes passages in a foreign language, these passages include markup that declares the language in a manner that is compatible with assistive technology.	N/A
Additional Information:	Do not have Adobe Pro/Complete version.

11.Images

A. Non-decorative images have alternative text that is compatible with assistive technology (or is rendered by an application such as a browser, media player, or reader that offers this functionality).	Fail
Additional Information:	0/25 pages had proper description of non-decorative images (Pg. 9, 22, 32-43, 52-64, 100-117, 163-173). Images were skipped with only the captions read aloud to describe the images. Captions did not contain enough information to properly describe what was contained in the images.
B. Decorative images are marked with null alternate text or contain markup that allows them to be ignored by assistive technology.	Pass
Additional Information:	Only one page had a decorative image. 1/1 page had proper description of the decorative image on the title page (Pg. 1). The title page and image was skipped.
C. Complex images, charts, and graphs have longer text descriptions that are compatible with assistive technology (or are rendered by an application such as a browser, media player, or reader) that offers this functionality).	Fail
Additional Information:	0/25 pages had proper description of complex images (Pg. 9, 22, 32-43, 52-64, 100-117, 163-173). Images were skipped with only the captions read aloud to describe the images. Captions did not



	contain enough information to properly describe what was contained in the images.
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12. Multimedia

A. A synchronized text track (e.g. open or closed captions) is provided with all video content.	N/A
Additional Information:	No multimedia content found.
B. A transcript is provided with all audio content.	N/A
Additional Information:	No multimedia content found.
C. Audio/video content is delivered via a media player that is compatible with assistive technology. This includes support for all criteria listed in Section 15 below.	N/A
Additional Information:	No multimedia content found.

13. Flickering

A. The digital resource content does not contain anything that flashes more than three times in any one-second period.	Pass
Additional Information:	No flickering content.

14. Science, Technology, Engineering, and Math (STEM)

A. STEM figures have appropriate markup that indicates that the image is a figure.	N/A
Additional Information:	No STEM content found.
B. STEM graphs have appropriate markup that indicates that the image is a graph.	N/A
Additional Information:	No STEM content found.
C. STEM equations have appropriate markup that indicates that the image is an equation.	N/A
Additional Information:	No STEM content found.



D. STEM tables have appropriate markup that indicates the image is a table.	N/A
Additional Information:	No STEM content found.
E. STEM figures have appropriate notation markup that conveys both the notation (presentation) and meaning (semantics) of the STEM content.	N/A
Additional Information:	No STEM content found.
F. STEM graphs have appropriate notation markup that conveys both the notation (presentation) and meaning (semantics) of the STEM content.	N/A
Additional Information:	No STEM content found.
G. STEM equations have appropriate notation markup that conveys both the notation (presentation) and meaning (semantics) of the STEM content.	N/A
Additional Information:	No STEM content found.
H. Assistive technology used can access the content from the STEM tables.	N/A
Additional Information:	No STEM content found.

15. Interactive Elements

A. Each interactive element (e.g. menu, hyperlink, button) and function (e.g. annotations) allows keyboard-only operation both with and without assistive technology.	N/A
Additional Information:	No interactive elements found.
B. Each interactive element conveys information to assistive technology regarding the element's name, type, and status (e.g. "Play, button, selected").	N/A
Additional Information:	No interactive elements found.



C. All instructions, prompts, and error messages necessary to complete forms are conveyed as text to assistive technology (or are rendered by an application such as a browser, media player, or reader that offers this functionality).	N/A
Additional Information:	No interactive elements found.

DETAILED ACCESSIBILITY EVALUATION REPORT using Non-Assistive Technologies

Non-Assistive Technologies (NAT) Evaluations applies only native or basic tools and software such as the keyboard and Narrator in the accessibility evaluation process. These non-assistive technologies are readily available and used by the general public.

1. Accessibility Documentation

A. The organization providing the online materials has a formal accessibility policy.	Fail
Additional Information:	No Content Found.
B. The organization providing the online materials has an accessibility statement.	Fail
Additional Information:	No Content Found.
C. An Accessibility Evaluation Report is available from an external organization.	Fail
Additional Information:	No Content Found.

2. Text Access

A. The text of the digital resource is available to assistive technology that allows the user to enable text-to-speech (TTS) functionality.	Pass
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Additional Information:	Pgs 8-15 were checked. The text is available to assistive technology that allows user to enable text-to-speech functionality.
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3. Text Adjustment

A. Text is compatible with assistive technology.	Pass
Additional Information:	Pgs 8-13 were checked. When the window page chaged in size, no horizontal bar appeared. The font size of all pages checked could be adjusted.
B. The resource allows the user to adjust the font size and font/background color (or is rendered by an application such as a browser, media player, or reader) that offers this functionality).	Fail
Additional Information:	Pgs 8-13 were checked. When changing the font/background color to green text on black, the background color did change to black and the font color did change to green. However, chapter titles and major headings within a chapter did not change to green. They were outlined in blue.

4. Reading Layout

A. Text of the digital resource is compatible with assistive technology that allows the user to reflow the text by specifying the margins and line spacing (or is rendered by an application such as a browser, media player, or reader that offers this functionality).	Fail
Additional Information:	Pgs 8-13 were checked. When reflowing the text, the text to speech function did work. The text was available for assistive technology. The text was able to reflow. Except that on pages 10 and 12 the text disappeared. The text-to-speech function still was not able to read the pages. The text-to-speech function said "warning empty page."



B. If the digital resource is an electronic alternative to printed materials, the page numbers correspond to the printed material.	N/A
Additional Information:	Need additional information. We do not have printed material to compare it too.

5. Reading Order

A. The reading order for digital resource content logically corresponds to the visual layout of the page when rendered by assistive technology.	Pass
Additional Information:	Pgs 8-15 were checked. The reading order was logical on all five pages.

6. Structural Markup/Navigation

A. The text of the digital resource includes markup (e.g. tags or styles) that allows for navigation by key structural elements (chapters, headings, pages) using assistive technology (or is rendered by an application such as a browser, media player, or reader that offers this functionality).	Fail
Additional Information:	The tagged PDF, Headings, and Title all failed using the accessibility checker. Bookmarks passed.
B. The text of the digital resource includes markup for bullets and numbered lists that is compatible with assistive technology (or is rendered by an application such as a browser, media player, or reader that offers this functionality).	Fail
Additional Information:	There were no list structural markups. The Tagged PDF, Headings, and Title all failed using the accessibility checker. Bookmarks passed.
C. If the text of the digital resource is delivered within an ebook reader application, a method is provided that allows users to bypass the	Fail



reader interface and move directly to the text content that is compatible with assistive technology.	
Additional Information:	There was none found. The Tagged PDF, Headings, and Title all failed using the accessibility checker. Bookmarks passed.

7. Tables

A. Data tables include markup (e.g. tags or styles) that identifies row and column headers in a manner that is compatible with assistive technology (or are rendered by an application such as a browser, media player, or reader that offers this functionality).	Fail
Additional Information:	0/5 tables included alternative text that were identified as rows and columns headers. The tables were on pages 47, 61, 83, 105, and 107. However, The text-to-speech function read the tables by row and by column. Using the accessibility checker, the rows TH and TD, headers and regularity all failed.

8. Hyperlinks

A. In-book links take you to a location within the textbook. For example, the table of contents would be considered in-book links and embedded links take you to the correct location in the book.	N/A
Additional Information:	No within links found.
B. Live hyperlinks take you to any website or webpages external to the book.	Pass
Additional Information:	20/20 live links worked. The link were found on pages 2 (3 links), 3, 5, 6, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, and 33. All live links were in descriptive enough to convey meaning. The text-to-speech function read the link in URL form. Using the accessibility checker, the navigation links passed.



C. Live links take you to the correct webpage that is functioning properly.	Pass
Additional Information:	20/20 live links worked. The link were found on pages 2 (3 links), 3, 5, 6, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, and 33. The accessibility checker showed nagivation links passed.
D. Live links are descriptive enough for the users to know where it should take them.	Pass
Additional Information:	20/20 live links were descriptive enough. The links were found on pages 2 (3 links), 3, 5, 6, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, and 33. The links were desceptive enough to convey meaning. Using the accessibility checker, navigation links passed.

9. Color and Contrast

A. All information within the material that is conveyed using color is also available in a manner that is compatible with those that do not perceive color, and information conveyed by color is also conveyed in other ways.	Pass
Additional Information:	Pgs 8-21 were checked. Information not conveyed by color alone. Size of font was used to convey information as well as the style (bold vs non-bold text). The chapter titles are larger is size compared to the rest of the text. Links were in blue and underlined throughout the text. The chapter titles and subheaders within a chapter were in blue and bold. The size of these was also larger than the rest of the text.
B. Information is conveyed from the sub-categories for contrast.	Pass
Additional Information:	Pgs 8-21 were checked. Most pages had the contrast ratio of 4.51:1 and above (20.5:1). The chapter titles were larger in size compared to the rest of the text. The chapter titles passed with 16.01:1. Subheaders within a chapter were in blue and passed with a ratio of 16.01:1. Small headers at the top of the page



	failed with a ratio of 15.1:1. Links were in blue and underlined and passed with a ratio of 16.01:1.
C. Contrast for headers passed WCAG AA standards for large texts (contrast ratio 3:1).	Pass
Additional Information:	Pgs 8-21 were checked. Large chapter headings passed with a ratio of 16.01:1. Small headers at the top of the page failed with a ratio of 15.1:1.
D. Contrast for text passed WCAG AA standards for normal texts (contrast ratio of 4.5:1).	Pass
Additional Information:	Pgs 8-21 were checked. The text on pages checked had the contrast ratio of 4.51:1 and above (20.05:1). The chapter titles were larger in size compared to the rest of the text. The chapter titles passed with 16.01:1. Small headers at the top of the page failed with a ratio of 15.1:1. Links were in blue and passed with a ratio of 16.01:1.
E. Contrast for simple images (for example, images of atoms) passed WCAG AA standards (contrast ratio of 4.5:1).	Pass
Additional Information:	Pgs 8-21 were checked. Simple images failed with a ratio of 4.51:1 and above (Example: On page 22, the simple image passed with a ratio of 20.75:1).

10. Language

A. The text of the digital resource includes markup that declares the language of the content in a manner that is compatible with assistive technology.	Fail
Additional Information:	Using the accessibility checker the primary language failed.
B. If the digital resource includes passages in a foreign language, these passages include markup that declares the language in a manner that is compatible with assistive technology.	Fail



Additional Information:	Using the accessibility checker the primary language failed.
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11.Images

A. Non-decorative images have alternative text that is compatible with assistive technology (or is rendered by an application such as a browser, media player, or reader that offers this functionality).	Fail
Additional Information:	0/10 non-decorative images included alternative text. Images were found on pages 9, 22, 32, 38, 39, 42 (2 images), 43, 52, and 58. Figures alternative text failed. Markups for images were named exhibit. Essentially every image was an exhibit.
B. Decorative images are marked with null alternate text or contain markup that allows them to be ignored by assistive technology.	N/A
Additional Information:	No Decorative images found. Figures alternative text failed.
C. Complex images, charts, and graphs have longer text descriptions that are compatible with assistive technology (or are rendered by an application such as a browser, media player, or reader) that offers this functionality).	Fail
Additional Information:	2/10 complex images had descriptive alternative text. Images were found on pages 34, 47, 55, 61, 73, 74, 75, 79 (2 images), and 80. All complex images did not have alternative text that conveyed meaning of the images. Figures alternative text failed.

12.Multimedia

A. A synchronized text track (e.g. open or closed captions) is provided with all video content.	N/A
Additional Information:	No content found.



B. A transcript is provided with all audio content.	N/A
Additional Information:	No content found.
C. Audio/video content is delivered via a media player that is compatible with assistive technology. This includes support for all criteria listed in Section 15 below.	N/A
Additional Information:	No content found.

13.Flickering

A. The digital resource content does not contain anything that flashes more than three times in any one-second period.	Pass
Additional Information:	Pgs 1-10 were checked. No flickering content was observed. Using the accessibility checker, screen flicker passed.

14.Science, Technology, Engineering, and Math (STEM)

A. STEM figures have appropriate markup that indicates that the image is a figure.	N/A
Additional Information:	No STEM content found throughout the book.
B. STEM graphs have appropriate markup that indicates that the image is a graph.	N/A
Additional Information:	No STEM content found throughout the book.
C. STEM equations have appropriate markup that indicates that the image is an equation.	N/A
Additional Information:	No STEM content found throughout the book.
D. STEM tables have appropriate markup that indicates the image is a table.	N/A
Additional Information:	No STEM content found throughout the book.
E. STEM figures have appropriate notation markup that conveys both the notation (presentation) and meaning (semantics) of the STEM content.	N/A



Additional Information:	No STEM content found throughout the book.
F. STEM graphs have appropriate notation markup that conveys both the notation (presentation) and meaning (semantics) of the STEM content.	N/A
Additional Information:	No STEM content found throughout the book.
G. STEM equations have appropriate notation markup that conveys both the notation (presentation) and meaning (semantics) of the STEM content.	N/A
Additional Information:	No STEM content found throughout the book.
H. Assistive technology used can access the content from the STEM tables.	N/A
Additional Information:	No STEM content found throughout the book.

15. Interactive Elements

A. Each interactive element (e.g. menu, hyperlink, button) and function (e.g. annotations) allows keyboard-only operation both with and without assistive technology.	N/A
Additional Information:	No Interactive Element Present.
B. Each interactive element conveys information to assistive technology regarding the element's name, type, and status (e.g. "Play, button, selected").	N/A
Additional Information:	No Interactive Element Present.
C. All instructions, prompts, and error messages necessary to complete forms are conveyed as text to assistive technology (or are rendered by an application such as a browser, media player, or reader that offers this functionality).	N/A
Additional Information:	No Interactive Element Present.



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