



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: Calculus: Early Transcendentals
Format of Textbook: PDF

Assistive Technology (AT) Evaluation Score: Overall	6.6 (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	4.6 (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. 12, 106, 112, 254, 281). Text was read in logical order with no content skipped.

3. Text Adjustment

A. Text is compatible with assistive technology.	Pass
Additional Information:	5/5 pages were able to properly adjust font size (Pg. 12, 106, 112, 254, 281). However, the reader had to



	horizontally scroll in order to read all of the content on the screen.
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 proper adjustment of font and background color (Pg. 12, 106, 112, 254, 281). Normal text was able to properly adjust but lines of axes in graphs remained black.

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. 12, 106, 112, 254, 281), but it is because the text did not readjust when zoomed in or out. The layout of the text remained the same.
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. 12, 106, 112, 254, 281). The textbook was read in a logical order that even though equations were not read properly,



	the reader would still be able to know where they are in the textbook.
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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:	0/16 pages had proper proper navigation of text while using the NVDA hotkeys (Pg. 11, 12, 106-112, 254-281). Headers, lists, and tables 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. 11, 12, 106-109, 260-268). The NVDA reader stated that there was "no next list/item."
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:	Not using eReader application.

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	Fail
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such as a browser, media player, or reader that offers this functionality).	
Additional Information:	Only two tables were found, 0/2 tables were properly navigable using the NVDA hotkeys (Pg. 14, 18). Tables were not read properly, the NVDA reader read something totally different than what was in the tables.

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.	Pass
Additional Information:	25/30 within book hyperlinks were properly functioning (Pg. 5(2), 12-19(6), 45-74(10), 120-153(7)). The remaining 5 hyperlinks did not connect to proper places within the books (Pg. 17, 44(2),45(2)).
B. Live hyperlinks take you to any website or webpages external to the book.	Fail
Additional Information:	Only 5 hyperlinks were found. 5/5 live hyperlinks were properly functioning (Pg. 2(2), 12, 65(2)). The links connected to proper places online. Only 5 hyperlinks were found. 1/5 live hyperlinks had proper descriptions (Pg. 12). The remaining 4 hyperlinks were labeled as URLs.
C. Live links take you to the correct webpage that is functioning properly.	Pass
Additional Information:	Only 5 hyperlinks were found. 5/5 live hyperlinks were properly functioning (Pg. 2(2), 12, 65(2)). The links connected to proper places online.
D. Live links are descriptive enough for the users to know where it should take them.	Fail



Additional Information:	Only 5 hyperlinks were found. 1/5 live hyperlinks had proper descriptions (Pg. 12). The remaining 4 hyperlinks were labeled as URLs.
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9. Color and Contrast

<p>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.</p>	Pass
Additional Information:	15/15 pages had consistent color redundancy (Pg. 11, 12, 106-112, 254-281). Headers and text were consistently black against a white background while links were consistently navy blue against a white background.
<p>B. Information is conveyed from the sub-categories for contrast.</p>	Pass
Additional Information:	16/16 pages had headers with proper color contrast (Pg. 11, 12, 106-112, 254-281). Headers were black against white background. 16/16 pages had text with proper color contrast (Pg. 11, 12, 106-112, 254-281). Text was black against white background. 16/16 pages had simple images with proper color contrast (Pg. 11, 12, 106-112, 254-281). Simple images were black and white.
<p>C. Contrast for headers passed WCAG AA standards for large texts (contrast ratio 3:1).</p>	Pass
Additional Information:	16/16 pages had headers with proper color contrast (Pg. 11, 12, 106-112, 254-281). Headers were black against white background.
<p>D. Contrast for text passed WCAG AA standards for normal texts (contrast ratio of 4.5:1).</p>	Pass
Additional Information:	16/16 pages had text with proper color contrast (Pg. 11, 12, 106-112, 254-281). Text was black against white background.



E. Contrast for simple images (for example, images of atoms) passed WCAG AA standards (contrast ratio of 4.5:1).	Pass
Additional Information:	16/16 pages had simple images with proper color contrast (Pg. 11, 12, 106-112, 254-281). Simple images were black and white.

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
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:	0/32 pages had images that were properly described by the NVDA reader when read aloud (Pg. 10-20, 44-54, 61-69, 120-153). Images were skipped or not read in a logical manner. It made it difficult for the reader to understand.
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.



<p>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).</p>	<p>Fail</p>
<p>Additional Information:</p>	<p>0/32 pages had complex images that were properly described by the NVDA reader when read aloud (Pg. 10-20, 44-54, 61-69, 120-153). Images were skipped or not read in a logical manner. It made it difficult for the reader to understand.</p>

12. Multimedia

<p>A. A synchronized text track (e.g. open or closed captions) is provided with all video content.</p>	<p>N/A</p>
<p>Additional Information:</p>	<p>No multimedia content found.</p>
<p>B. A transcript is provided with all audio content.</p>	<p>N/A</p>
<p>Additional Information:</p>	<p>No multimedia content found.</p>
<p>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.</p>	<p>N/A</p>
<p>Additional Information:</p>	<p>No multimedia content found.</p>

13. Flickering

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

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

<p>A. STEM figures have appropriate markup that indicates that the image is a figure.</p>	<p>Pass</p>
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Additional Information:	10/10 figures had proper markup (Pg. 14, 15, 16, 104, 105, 108, 110, 256, 264). Figures were all labeled as figures.
B. STEM graphs have appropriate markup that indicates that the image is a graph.	Fail
Additional Information:	0/10 graphs had proper markup (Pg. 14, 15, 16, 104, 105, 108, 110, 256, 264). All graphs were labeled as figures.
C. STEM equations have appropriate markup that indicates that the image is an equation.	Pass
Additional Information:	10/10 equations had proper markup (Pg. 13, 14(5), 16, 103, 106, 253). All equations were visible, none of them were blacked out.
D. STEM tables have appropriate markup that indicates the image is a table.	Fail
Additional Information:	Only two tables were found, 0/2 tables had proper markup (Pg. 14, 18). Tables were not labeled as tables.
E. STEM figures have appropriate notation markup that conveys both the notation (presentation) and meaning (semantics) of the STEM content.	Fail
Additional Information:	0/10 figures were read properly (Pg. 14, 15, 16, 104, 105, 108, 110, 256, 264). Figures were not described when read aloud, only the captions were read and the captions did not provide enough information to describe what was in the figures.
F. STEM graphs have appropriate notation markup that conveys both the notation (presentation) and meaning (semantics) of the STEM content.	Fail
Additional Information:	0/10 graphs were read properly (Pg. 14, 15, 16, 104, 105, 108, 110, 256, 264). Graphs were not described when read aloud, only the captions were read and the captions did not provide enough information to describe what was in the graphs.



<p>G. STEM equations have appropriate notation markup that conveys both the notation (presentation) and meaning (semantics) of the STEM content.</p>	<p>Fail</p>
<p>Additional Information:</p>	<p>2/10 equations had proper notation markup (Pg. 14(2)). The remaining 8 equations (Pg. 13, 14(3), 16, 103, 106, 253) had coordinates that were skipped, degrees were skipped, triangles were pronounced as "cent", variables were skipped, "/" were read as "slash" instead of division symbols, < and > signs were skipped, square root signs were pronounced as "T", and fractions were pronounced as whole numbers (Ex: 1/2=12).</p>
<p>H. Assistive technology used can access the content from the STEM tables.</p>	<p>Fail</p>
<p>Additional Information:</p>	<p>Only two tables were found, 0/2 tables had proper notation markup (Pg. 14, 18). Tables were not read properly, the NVDA reader read something totally different than what was in the tables.</p>

15. Interactive Elements

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



Additional Information:	No interactive elements found.
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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
Additional Information:	Pgs 9-14 were checked. Most content was read correctly, however, when there is math and equations involved, it read it wrong. For example, in an equation, " - "should be "minus" but the reader reads it as "dash."



3. Text Adjustment

A. Text is compatible with assistive technology.	Pass
Additional Information:	Pgs 5-10 were checked. Whent 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).	Pass
Additional Information:	Pgs 1-5 checked. All pages passed with both background and font changed in color.

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 1-5 were checked. All text does not reflow.
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 8-12 checked. The reading order was logical on all five pages.



6. Structural Markup/Navigation

<p>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).</p>	<p>Fail</p>
<p>Additional Information:</p>	<p>Passes bookmarks but tagged PDF, Title, and Headings all failed using the accessibility checker.</p>
<p>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).</p>	<p>Fail</p>
<p>Additional Information:</p>	<p>All lists failed by Acc checker.</p>
<p>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.</p>	<p>N/A</p>
<p>Additional Information:</p>	<p>No additional eReader used.</p>

7. Tables

<p>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).</p>	<p>Fail</p>
<p>Additional Information:</p>	<p>0/5 tables passed, p14, checked. All 5 table was read but users will not be able to know where they are on the table. Acc checker indicated all tables failed row</p>



	and col and when check manually, it does not read rows and col.
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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.	Pass
Additional Information:	30/30 links passed. Table of content in the beginning of each chapter all functioned correctly.
B. Live hyperlinks take you to any website or webpages external to the book.	Fail
Additional Information:	Live links worked fine but don't have descriptions.
C. Live links take you to the correct webpage that is functioning properly.	Pass
Additional Information:	2/2 live links passed. Only 2 live links found on page 2, both worked.
D. Live links are descriptive enough for the users to know where it should take them.	Fail
Additional Information:	0/2 live links passed description. No links have good description, all live links are URL. P2(2).

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.	Fail
Additional Information:	All links (inbook and live) are showd as blue but no underline or conveyed in any other way.
B. Information is conveyed from the sub-categories for contrast.	Pass
Additional Information:	Average



C. Contrast for headers passed WCAG AA standards for large texts (contrast ratio 3:1).	Pass
Additional Information:	All headers are black and passed AA standard.
D. Contrast for text passed WCAG AA standards for normal texts (contrast ratio of 4.5:1).	Pass
Additional Information:	All text are black on white and passed AA standard.
E. Contrast for simple images (for example, images of atoms) passed WCAG AA standards (contrast ratio of 4.5:1).	Pass
Additional Information:	All simple images checked are black on white, pass contrast ratio. Pgs 1-26 checked.

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.	N/A
Additional Information:	Acc checker cannot evaluate secondary language. Also, no second language was found in the book.

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
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Additional Information:	0/11 images passed. P1-26 checked. All images do not have good description. Some have explanation in the text around it but not describing the image enough for users to understand without vision. No alternative text was provided.
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.
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).	N/A
Additional Information:	No complex image found.

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.	Pass
Additional Information:	10/10 passed. All figures have markups. P14(1), p15(1), p16 (4), p19(1), p21(3) checked, all passed.
B. STEM graphs have appropriate markup that indicates that the image is a graph.	N/A
Additional Information:	All Graphs are considered figures in this book, please refer to figure.
C. STEM equations have appropriate markup that indicates that the image is an equation.	Fail
Additional Information:	0/10 passed. Equations do not have markups. P14(6), p16(4) checked, all failed.
D. STEM tables have appropriate markup that indicates the image is a table.	Fail
Additional Information:	Tables do not have mark ups indication they are tables, Acc checker fail all tables.
E. STEM figures have appropriate notation markup that conveys both the notation (presentation) and meaning (semantics) of the STEM content.	Fail
Additional Information:	0/10 passed. All figures do not have good descriptions. P14(1), p15(1), p16 (4), p19(1), p21(3) checked, all failed.
F. STEM graphs have appropriate notation markup that conveys both the notation (presentation) and meaning (semantics) of the STEM content.	N/A
Additional Information:	All Graphs are considered figures in this book, please refer to figure.
G. STEM equations have appropriate notation markup that conveys both the notation (presentation) and meaning (semantics) of the STEM content.	Fail



Additional Information:	0/10 passed. All equations are read incorrectly. P14(6), p16(4) checked, all failed.
H. Assistive technology used can access the content from the STEM tables.	Fail
Additional Information:	Tables cannot be navigate through in rows and cols, Acc checker fail all tables.

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 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 Elements 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 Elements Present.

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