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: **College Algebra**
Format of Textbook: **PDF**

Assistive Technology (AT) Evaluation Score: Overall	6.7 (Maximum score = 10)
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. • 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	7.0 (Maximum score =10)
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.	

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:	**Could not find this information.**
B. The organization providing the online materials has an accessibility statement.	**Fail**
Additional Information:	**Could not find this information.**
C. An Accessibility Evaluation Report is available from an external organization.	**Fail**
Additional Information:	**Could not find this information.**

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:	**NVDA read all the text on pages 11-15. However, the pace was very fast and sometimes difficult to understand.**

3. Text Adjustment

A. Text is compatible with assistive technology.	**Pass**
Additional Information:	**Used Adobe Reader XI and the text size was adjustable on pages 11-15. However all the text was squished together and there were no spaces between the words.**
B. The resource allows the user to adjust the font size and font/background color (or is	**Pass**

rendered by an application such as a browser, media player, or reader) that offers this functionality.	
Additional Information:	**Used Adobe Reader XI to adjust the font and background colors. The colors were adjustable on pages 11-15.**

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:	**Used Adobe Reader XI and the text reflowed on pages 11-15. However, the pages became different sizes and were off center/not aligned well. Had to use the left and right scroll bar.**
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.**

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:	**Used NVDA and checked the digitial resource layout on pages 11, 15, 19, 21, and 26. The reading order logically corresponds to the page layout.**

6. Structural Markup/Navigation

A. The text of the digital resource includes markup (e.g. tags or styles) that allows for	**Fail**

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).	
Additional Information:	**Used NVDA and checked pages 11-46. No headings were found. "No next heading."**
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:	**Used NVDA and checked lists on pages 14, 17, 19, 20, 35, 36, 41, 55, 105, and 131. No lists were found. "No next list."**
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 reader 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 such as a browser, media player, or reader that offers this functionality).	**Pass**
Additional Information:	**Used NVDA to check table markup. 10/10 tables were detected and indicated the correct numbers of rows and columns. Checked tables on pages 13, 14, 24, 27, 34, 103, 104, 130, 132, and 133.**

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 in book links functioned. Checked in book links on pages 3, 4, 5, 6, 352, 355, 356, 357, 364, 703, 704, 705, 705, and 706.**
B. Live hyperlinks take you to any website or webpages external to the book.	**Pass**
Additional Information:	**20/20 live links function and 18/20 live links have an acceptable description. Checked live links on pages 8, 11, 13, 14, 21, 29, 42, 360, 361, 667, 668, 669, 676, 683, 688, and 701.**
C. Live links take you to the correct webpage that is functioning properly.	**N/A**
Additional Information:	**20/20 live links function. Checked live links on pages 8, 11, 13, 14, 21, 29, 42, 360, 361, 667, 668, 669, 676, 683, 688, and 701.**
D. Live links are descriptive enough for the users to know where it should take them.	**N/A**
Additional Information:	**18/20 live links have an acceptable description. Checked live links on pages 8, 11, 13, 14, 21, 29, 42, 360, 361, 667, 668, 669, 676, 683, 688, and 701.**

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:	**When color is used to indicate something is a link it is not always underlined, therefore showing no color redundancy. Checked pages 1-35.**

B. Information is conveyed from the sub-categories for contrast.	**Pass**
Additional Information:	**Used Adobe Acrobat XI and Colour Contrast Analyzer to check the headers, text, and simple images for color contrast requirements. All headers pass the color contrast requirements. Most of the text passed. However, whenever pink text was used it did not pass. No simple images found. Checked pages 26-90.**
C. Contrast for headers passed WCAG AA standards for large texts (contrast ratio 3:1).	**Pass**
Additional Information:	**Used Adobe Acrobat XI and Colour Contrast Analyzer to check the headers and all headers pass the color contrast requirements. Checked pages 26-90.**
D. Contrast for text passed WCAG AA standards for normal texts (contrast ratio of 4.5:1).	**Pass**
Additional Information:	**Used Adobe Acrobat XI and Colour Contrast Analyzer to check text and most of the text passed. However whenever pink text was used it did not pass. Checked pages 26-90.**
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**
Additional Information:	**Cannot check this because do not have Adobe Acrobat Pro.**
B. If the digital resource includes passages in a foreign language, these passages include markup that declares the language in a	**N/A**

manner that is compatible with assistive technology.	
Additional Information:	**Cannot check this because do not have Adobe Acrobat Pro.**

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:	**NVDA did not detect non-decorative images, there was no alternative text and the descriptions were not descriptive enough. Checked pages 11-82.**
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).	**Fail**
Additional Information:	**NVDA did not detect complex images, there was no alternative text and the descriptions were not descriptive enough. Checked pages 11-82.**

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 found.**
B. A transcript is provided with all audio content.	**N/A**
Additional Information:	**No multimedia 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 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 found.**

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

A. STEM figures have appropriate markup that indicates that the image is a figure.	**Fail**
Additional Information:	**0/10 figures had labels. Checked figures on pages 14, 16, 17, 18, 19, 21, 23, 25, 35, and 37.**
B. STEM graphs have appropriate markup that indicates that the image is a graph.	**Fail**
Additional Information:	**0/10 graphs had labels. Checked graphs on pages 18, 20, 22, 28, 30, 31, 32, 33, 34, and 39.**
C. STEM equations have appropriate markup that indicates that the image is an equation.	**Fail**
Additional Information:	**3/10 equations had labels. Checked equations pages 12, 15, 21, 23, 33, 86, 104, 115, 145, and 147.**
D. STEM tables have appropriate markup that indicates the image is a table.	**Fail**
Additional Information:	**0/10 tables had labels. Checked tables on pages 13, 14, 24, 27, 34, 103, 104, 130, 132, and 133.**
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 had acceptable descriptions and the reader skips over the images. Checked figures on pages 14, 16, 17, 18, 19, 21, 23, 25, 35, and 37.**
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 had acceptable descriptions and the reader skips over the graph. Checked graphs on pages 18, 20, 22, 28, 30, 31, 32, 33, 34, and 39.**
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 equations had descriptions and reader read the equations incorrectly. Checked equations pages 12, 15, 21, 23, 33, 86, 104, 115, 145, and 147.**
H. Assistive technology used can access the content from the STEM tables.	**Pass**
Additional Information:	**10/10 tables were detected and indicated the correct numbers of rows and columns. Checked tables on pages 13, 14, 24, 27, 34, 103, 104, 130, 132, and 133.**

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**
Additional Information:	**Pgs 15-20 were checked. The text is available to be used by assistive technology. The text-to-speech**

	functionality allows users to hear each page being read in a top-down, left-to-right fashion. However, special characters in formulas/equations discernable by Adobe Read Out Loud (see pg 15).

3. Text Adjustment

A. Text is compatible with assistive technology.	**Pass**
Additional Information:	**Pgs 15-20 were checked. Text reflows with size adjustment. However, when reflow option is selected the text becomes condensed so as to remove any spaces between words.**
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 15-20 were checked. The document succesfully supports adjustment of text color when using a black background and green text.**

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:	**Pgs 15-20 were checked. Text reflows with zoom. However, when reflow option is selected the text becomes condensed so as to remove any spaces between words.**
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 300-305 were checked. While the reading order for paragraphs was executed in a logical fashion, the manner in which graphs were read was not easily understood (see pg 305).**

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:	**No method provided that allows user to bypass sections of text. The tagged PDF, Title, Bookmarks, and Headings all failed using the accessibility checker.**
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:	**No markups found. The Tagged PDF, Title, Bookmarks, and Headings all failed.**
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	**N/A**

reader interface and move directly to the text content that is compatible with assistive technology.	
Additional Information:	**No additional eReader used.**

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:	**Pgs 131, 137, 308, 311. Using the accessibility checker, the rows, TH and TD, headers and regularity all failed. Manual check with Read Out Loud separated and read tables by row, left-to-right, top-down. Special characters such as "-" were not identified by the text-to-speech function.**

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:	**Within book links in the Table of Contents work and Navigation Links passed the Accesibility Check.**
B. Live hyperlinks take you to any website or webpages external to the book.	**Pass**
Additional Information:	**20/20 live links worked. Pg's 1-100 were checked.**
C. Live links take you to the correct webpage that is functioning properly.	**Pass**
Additional Information:	**20/20 live links worked. Pgs 1-100 were checked.**

D. Live links are descriptive enough for the users to know where it should take them.	**Fail**
Additional Information:	**10/20 live links had a description. Pg's Tble of Contents-151. There is a mix of url and single word descriptions (ex "www.stitz-zeager.com" and "Lulu.com" on page X, "Rene Descartes" on pg 6, "countable" and "uncountable" on pg 21, "here" on pg 32, "www.mathforum.org" and "www.mathworld.wolfram.com" pg 151.**

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 130-180 were checked. Different font sizes and types were used. Chapter headings were larger when compared to subheadings. Body paragraph text was smallest overall, with italics and bold used to emphasize. However, within book links cannot be identified by something other than color.**
B. Information is conveyed from the sub-categories for contrast.	**Pass**
Additional Information:	**Overall score**
C. Contrast for headers passed WCAG AA standards for large texts (contrast ratio 3:1).	**Pass**
Additional Information:	**Pgs 20-35 were checked. Large chapter headings passed with a ratio of 21.0:1.**
D. Contrast for text passed WCAG AA standards for normal texts (contrast ratio of 4.5:1).	**Pass**
Additional Information:	**Pgs 20-35 were checked. The text was above the ratio 20.5:1.**

E. Contrast for simple images (for example, images of atoms) passed WCAG AA standards (contrast ratio of 4.5:1).	**Pass**
Additional Information:	**Pgs 20-35, 170-190 were checked. Simple images passed with a ratio of 21.0:1 (see pg 165), 9.87:1 (see pg 496) and 10.46:1 (see pg 642).**

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.**

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:	**10/10 Overall images did include descriptions. However, the descriptions were part of the text and not directly below the image (see pgs 98, 106, 175, 496, 497, 556, 642). Accessibility Checker failed figures and alternate text.**

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 content 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).	**Fail**
Additional Information:	**Only two complex images found (see pgs 556, 642). However, description for either of these is not adequate. Accessibility Checker failed figures and alternate text.**

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 4-14 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.	**Fail**
Additional Information:	**0/10 were appropriately described (see pgs 60, 62, 66, 67, 125, 126). Overall, figures failed to have appropriate descriptions. Figures do not have descriptions or tags. Read Out Loud did not recognize some of the characters in the equation.**
B. STEM graphs have appropriate markup that indicates that the image is a graph.	**Fail**
Additional Information:	**0/10 were properly described (see pgs 127, 128129, 130, 131, 132, 133, 134, 135, 136, 137). Overall graphs were not properly marked up with appropriate descriptions. A description was not available. Read Out Loud did not give a coherent read of the graph.**
C. STEM equations have appropriate markup that indicates that the image is an equation.	**Fail**
Additional Information:	**0/10 equations contained a description of the equation (see pgs 131, 137, 244, 364, 365, 398, 417, 418 498). No descriptions available. Read Out Loud function read from left-to-right, top-down. However, not all the characters were read correctly.**
D. STEM tables have appropriate markup that indicates the image is a table.	**Fail**
Additional Information:	**0/10 tables contained a description of the table (see pgs 131, 137, 228, 230, 243, 248). No descriptions available. Read Out Loud function read from left-to-right, top-down. However, not all the characters were read correctly.**
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 had the appropriate tags or markup (see pgs 60, 62, 66, 67, 125, 126). Overall, figures failed to have appropriate descriptions. Figures do not have descriptions or tags. Read Out Loud did not recognize some of the characters in the equation.**
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 were properly marked upor tagged (see pgs 127, 128129, 130, 131, 132, 133, 134, 135, 136, 137). Overall graphs were not properly marked up with appropriate descriptions. A description was not available. Read Out Loud did not give a coherent read of the graph.**
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 equations were properly tagged or marked up (see pgs 131, 137, 244, 364, 365, 398, 417, 418 498). No descriptions available. Read Out Loud function read from left-to-right, top-down. However, not all the characters were read correctly.**
H. Assistive technology used can access the content from the STEM tables.	**Fail**
Additional Information:	**0/10 tables were properly tagged or marked up (see pgs 131, 137, 228, 230, 243, 248). No descriptions available. Read Out Loud function read from left-to-right, top-down. However, not all the characters were read correctly.**

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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