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: **Mooculus Calculus**
Format of Textbook: **PDF**

Assistive Technology (AT) Evaluation Score: Overall	4.0 (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	6.3 (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:	**URL not found.**
B. The organization providing the online materials has an accessibility statement.	**Fail**
Additional Information:	**URL not found.**
C. An Accessibility Evaluation Report is available from an external organization.	**Fail**
Additional Information:	**URL not 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:	**10/10 pages passed. Pages 1-10 checked.**

3. Text Adjustment

A. Text is compatible with assistive technology.	**Pass**
Additional Information:	**7/7 pages passed. Pages 9-15 checked.**
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:	**0/31 pages passed. Pages 1-31 checked. Background adjusted color (white to black), but only text within certain "correction" or "warning" text boxes (ex: pages 9, 16, and 28) adjusted color (black to green). All text boxes' background colors (ex: page 10 and 13) did not adjust (to 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).	**Fail**
Additional Information:	**0/16 pages passed. Pages 1-16 checked. Pages lose all spaces between words, leaving long lines of text. Content is also strewn around, compacted or displaced severely (ex: page 9 and 14).**
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 material/links to printed material found in MERLOT website.**

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.	**Fail**
Additional Information:	**1/10 pages passed. Pages 1-10 checked.**

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	**Fail**

(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:	**0/15 pages 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).	**N/A**
Additional Information:	**Whenever there are bulleted lists, they are not marked up as a list (ex: page 78). Other numbered "lists" are things such as chapter exercises, which can understandably not be part of a list since each new number is a different problem entirely.**
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:	**eReader application not 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).	**N/A**
Additional Information:	**Table score presented in checkpoint 14A, STEM - Markup (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.	**Fail**
Additional Information:	**0/30 links passed. Pages 3-6. 95-96, and 245-258 checked.**
B. Live hyperlinks take you to any website or webpages external to the book.	**Fail**
Additional Information:	**Averaged score.**
C. Live links take you to the correct webpage that is functioning properly.	**Pass**
Additional Information:	**6/6 links passed. Page 2 checked. No live hyperlinks were found elsewhere in the material.**
D. Live links are descriptive enough for the users to know where it should take them.	**Fail**
Additional Information:	**0/6 links passed. Page 2 checked.**

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:	**Graphs that contain more than one line are labeled with their respective functions, but the lines often intersect, leaving ambiguity between which line is which after intersection (ex: pages 15, 50, 51, 58, 65, and 66). Links are considered acceptable, either being distinguished by their different font type (e.g., page 2), being amongst a list of links only (e.g., pages 2-6), or being a non-ASCII symbol (e.g., an arrow--see page 11 for an example).**

B. Information is conveyed from the sub-categories for contrast.	**Pass**
Additional Information:	**Averaged score.**
C. Contrast for headers passed WCAG AA standards for large texts (contrast ratio 3:1).	**Pass**
Additional Information:	**30/30 pages passed. Pages 7-36 checked. Headers are black on white (17.4:1, ex: page 8).**
D. Contrast for text passed WCAG AA standards for normal texts (contrast ratio of 4.5:1).	**Pass**
Additional Information:	**30/30 pages passed. Pages 7-36 checked. Text is either black on: white (17.4:1, ex: page 8), gray (12.45:1, ex: page 8), peach (13.67:1, ex: page 9), purple (12.55:1, ex: page 28).**
E. Contrast for simple images (for example, images of atoms) passed WCAG AA standards (contrast ratio of 4.5:1).	**Fail**
Additional Information:	**9/26 simple images passed. Pages 65-115 checked. Whenever more than one line is included in the same graph and intersect, their contrast is not sufficient for differentiation (2.65:1, ex: page 69, 73, 76, 90, 109). Other problem graphics: page 80, 83, 102, 115.**

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:	**Adobe Acrobat XI Pro primary language accessibility check 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:	**No foreign language passages found.**

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).	**N/A**
Additional Information:	**No images found.**
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 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 images 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 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:	**Pages 1-258 checked. No flickering found.**

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:	
B. STEM graphs have appropriate markup that indicates that the image is a graph.	**Fail**
Additional Information:	**0/10 graphs passed. Pages 10-25 checked.**
C. STEM equations have appropriate markup that indicates that the image is an equation.	**Fail**
Additional Information:	**0/10 equations passed. Pages 14-17 checked.**
D. STEM tables have appropriate markup that indicates the image is a table.	**N/A**
Additional Information:	**1/10 tables passed. Pages 19, 20, 60, 85, 89, 102, 192, and 193, and 207 checked.**
E. STEM figures have appropriate notation markup that conveys both the notation (presentation) and meaning (semantics) of the STEM content.	**N/A**
Additional Information:	
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 passed. Pages 10-25 checked.**
G. STEM equations have appropriate notation markup that conveys both the notation	**Fail**

(presentation) and meaning (semantics) of the STEM content.	
Additional Information:	**0/10 equations passed. Pages 14-17 checked.**
H. Assistive technology used can access the content from the STEM tables.	**Fail**
Additional Information:	**0/10 tables passed. Pages 19, 60, 192, 193, 207.**

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 19-24 were checked. The text is available to assistive technology that allows user to enable text-to-speech functionality.**

3. Text Adjustment

A. Text is compatible with assistive technology.	**Fail**
Additional Information:	**Pgs 19-24 were checked. When the window page chaged in size, but a 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,	**Fail**

media player, or reader) that offers this functionality).	
Additional Information:	**Pgs 19-24 were checked. When changing the font/background color to green text on black, the background color changed to black, and the font color did not change to green.**

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 19-24 were checked. I was able to reflow the text, however, when relfowing the text, the text to speech function said "warning empty page." This was consistent on all pages checked.**
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.	**Fail**
Additional Information:	**Pgs 19-24 were checked. The reading order was not logical on all five pages. Instead of reading what is on the left of the page first and then the right it read left to right when the right side was tables and graphs that should have been read after the text on the left was read.**

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, Title, and Headings all failed using the accessibility checker. However, the boomarks 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, Title, and Headings all failed using the accessibility checker. However, boomarks 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 reader interface and move directly to the text content that is compatible with assistive technology.	**N/A**
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:	**Tables on pages 19, 192, 193(2 tables), and 207 were checked manually. The text to speech function**

	seperated and read the tables by row. 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.	**Pass**
Additional Information:	**30/30 total in-book links worked. All links appeared to be links but did function as links. ---> (Beginning) Pg 4 was checked=(10/10) hyperlinks worked. ---> (Middle) Pg 128 was checked=(10/10) all hyperlinks did work ---> (End) Pgs 241 (9 links) and page 244 (1 links) were checked=(10/10) all hyperlinks did work---> Using the accessibility checker, navigations links passed.**
B. Live hyperlinks take you to any website or webpages external to the book.	**Fail**
Additional Information:	**5/5 live links worked. Pg 2 was checked. Only 5 live links were found throughout the entire book. However all five did not have good descriptions.**
C. Live links take you to the correct webpage that is functioning properly.	**Pass**
Additional Information:	**5/5 live links worked. Pg 2 was checked.**
D. Live links are descriptive enough for the users to know where it should take them.	**Fail**
Additional Information:	**0/5 live links had a description. Pg 2 was checked. 5 out of 5 links were in html (URL) form and did not have a description on where the link would take you.**

9. Color and Contrast

A. All information within the material that is conveyed using color is also available in a	**Pass**

manner that is compatible with those that do not perceive color, and information conveyed by color is also conveyed in other ways.	
Additional Information:	**Pgs 19-32 were checked. Information not conveyed by color alone. Size of font, and type of font (Bold versus Non-Bold font) were used. The chapter titles were in black font, bold font, and the size was larger than the rest of the text.**
B. Information is conveyed from the sub-categories for contrast.	**Pass**
Additional Information:	**Pgs 19-32 were checked. Most pages had the contrast ratio of 4.51:1 and above (14.19:1). The chapter titles were in black font, bold font, and the size was larger than the rest of the text: Had a ratio of 14.87:1. The background color of the pages was gray. There was text that was squared off and the background color of that was blue: passed with a ratio of 8.76:1. THere was text that was also squared off with the background color of red: passed with a ratio of 9.54:1.**
C. Contrast for headers passed WCAG AA standards for large texts (contrast ratio 3:1).	**Pass**
Additional Information:	**Pgs 19-32 were checked. Large chapter headings passed with a ratio of 14.87:1.**
D. Contrast for text passed WCAG AA standards for normal texts (contrast ratio of 4.5:1).	**Pass**
Additional Information:	**Pgs 19-32 were checked. Most of the text was above the ratio 4.51:1 (14.19:1). Large text and small text both had a ratio of 14.19:1.**
E. Contrast for simple images (for example, images of atoms) passed WCAG AA standards (contrast ratio of 4.5:1).	**Pass**
Additional Information:	**Pgs 19-32 were checked. Simple images passed with a ratio of 4.51:1 and above (8.6::1 page 25).**

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 accessiblity 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 accessiblity 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).	**N/A**
Additional Information:	**No Non-Decorative images found.**
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:	**10/10 image descriptions did convey meaning (descriptions were sufficient to convey meaning). Pgs 9 (2 figures), 10 (2 figures), 11 (2 figures), 14 (2 figures), and 15 (2 figures) had images and were**

	checked. All images did contain descriptions. Using the accessibility checker, figures alternate 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.	Pass
Additional Information:	10/10 figure markups did convey meaning. Pgs 9 (2 figures), 10 (2 figures), 11 (2 figures), 14 (2 figures), and 15 (2 figures) all had images and were checked. Overall the (labels/tags) did convey meaning.
B. STEM graphs have appropriate markup that indicates that the image is a graph.	N/A
Additional Information:	Graphs were under figure markups.

C. STEM equations have appropriate markup that indicates that the image is an equation.	**N/A**
Additional Information:	**No equations were found throughout the book.**
D. STEM tables have appropriate markup that indicates the image is a table.	**Pass**
Additional Information:	**6/6 table markups did provide enough information to convey meaning. Pgs 19, 192, 193 (2 tables), and 207 (2 tables) all had tables and were checked. Overall markups did convey meaning.**
E. STEM figures have appropriate notation markup that conveys both the notation (presentation) and meaning (semantics) of the STEM content.	**Pass**
Additional Information:	**10/10 notation markups were sufficient to convey meaning. The descriptions of the figures were sufficient enough to describe the figures. Pgs 9 (2 figures), 10 (2 figures), 11 (2 figures), 14 (2 figures), and 15 (2 figures)all had figures and were checked. The notation markups were sufficient enought to convey presentation.**
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 graphs were 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 equations were found throughout the book.**
H. Assistive technology used can access the content from the STEM tables.	**Fail**
Additional Information:	**0/6 notation markups provided good descriptions sufficient enough to convey meaning. Pgs 19, 192, 193 (2 tables) and 207 (2 tables) all had tables and**

	were checked. Notation markups were minimal and did not help to convey presentation.

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.	**Pass**
Additional Information:	**On page 3, there are within-book links and I am able to use my tab key and enter key to navigate the book. Markups were sufficient enough to convey meaning.**
B. Each interactive element conveys information to assistive technology regarding the element's name, type, and status (e.g. "Play, button, selected").	**Pass**
Additional Information:	**On page 3, there are within-book links and I am able to use my tab key and enter key to navigate the book.**
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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