

# 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: Sound Reasoning (OpenStax)

Format of Textbook: ePUB

Assistive Technology (AT) Evaluation Score: Overall	9.0 (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	
<ul> <li>themes, settings from the Keyboard and Mouse control panels)</li> <li>Accessibility-related software included with desktop operating systems (e.g. VoiceOver, Microsoft Narrator)</li> <li>Third-party accessibility software and hardware:</li> <li>Screen readers (e.g. JAWS, Window Eyes)</li> </ul>	
<ul> <li>Magnification software (e.g. ZoomText Magnifier/Reader, MAGIC Pro with Speech)</li> <li>Reading software for users with learning disabilities (e.g. Read and Write Gold, Kurzweil 3000)</li> <li>Refreshable Braille displays</li> </ul>	
Non- Assistive Technology (NAT) Evaluation Score: Overall	6.4 (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 <u>Accessible Technology Initiative</u> and <u>MERLOT</u> (Multimedia Educational Resources for Learning and Online Teaching) developed the rubric or "checkpoints" for the accessibility evaluation. <u>CAST</u>, 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 <u>Center for Usability in Design and Accessibility</u> 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:	No content was found.
B. The organization providing the online materials has an accessibility statement.	Fail
Additional Information:	No content was found.
C. An Accessibility Evaluation Report is available from an external organization.	Fail
Additional Information:	No content was 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:	21/21 pages passed. Pages 47-66 were evaluated. No issues were found.

## 3. Text Adjustment

A. Text is compatible with assistive technology.	Pass
Additional Information:	11/11 pages passed. Pages 11-30 were evaluated. All text was found to be adjustable. No issues were found.
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:	0/11 pages passed. Pages 2-13 evaluated.  Background color was adjusted successfully but the text did not change its color to the new setting. The only text available the black background was the hyperlinks because they were 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).	Pass
Additional Information:	11/11 pages passed. Pages 2-13 evaluated. All text reflow successfully with out any issues observed.
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 pass/fail rating can be assigned. The printed version is not 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 passed. Pages 70-81 evaluated. Reading order was logical in all pages evaluated. However, it should be noted that there's no image or tables in the entire book so we cannot evaluate a page with a more complecated layout.



# 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).	N/A
Additional Information:	No pass/fail rating can be assigned. The assistive technology used cannot evaluate structural markup.
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:	No pass/fail rating can be assigned. The assistive technology used cannot evaluate structural markup.
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 pass/fail rating can be assigned. The assistive technology used cannot evaluate structural markup.

# 7. Tables

Additional Information:	No pass/fail rating can be assigned. The assistive technology used cannot evaluate structural markup.
technology (or are rendered by an application such as a browser, media player, or reader that offers this functionality).	
A. Data tables include markup (e.g. tags or styles) that identifies row and column headers in a manner that is compatible with assistive	N/A



# 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:	29/30 inbook link passed. All links have good decription and most worked correctly. Page 3(16), 4(4), 57(2), 77(6), 94(2) checked. The only link that did not work properly was the first link on page 3.
B. Live hyperlinks take you to any website or webpages external to the book.	Fail
Additional Information:	Most link passed functionality but failed description, please see below for detail.
C. Live links take you to the correct webpage that is functioning properly.	Pass
Additional Information:	18/20 live links work properly. Page 2(2), 53(1), 57(2), 63(2), 94(2), 5(5), 98(4), 231(first 2) checked. One live link on page 94 direct me to the wrong location and one link on page 5 returns with page not found, error 404. The rest of the links functioned properly.
D. Live links are descriptive enough for the users to know where it should take them.	Fail
Additional Information:	5/20 live links have description. Page 2(2), 53(1), 57(2), 63(2), 94(2), 5(5), 98(4), 231(first 2) checked. Only the live links on page 5 were descriptive enough for the user to know where the links are taking them to. The rest of the links are either not not descriptive or just URLs.

## 9. Color and Contrast

A. All information within the material that is	Pass
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.	
Additional Information:	11/11 pages passed. Pages 28-37 were evaluated. When color was used to convey information, there was redundant coding (e.g., bolding and underlining for links). No issues were found.
B. Information is conveyed from the sub- categories for contrast.	Pass
Additional Information:	21/21 pages passed. Pages 47-66 were evaluated. Three types of text headings were evaluated. The first, the large title text (see page 47 for an example) is orange (#DC6623) and only passes for large text, not for small text. The second and third, the large heading text (see page 47 for an example) and smaller link text, are a blue color (#336699) and pass for both small and large text. Finally, the regular content is traditional black color (#000000) passes for both small and large text. All text was evaluate on a white (#F7F7F7) background.
C. Contrast for headers passed WCAG AA standards for large texts (contrast ratio 3:1).	Pass
Additional Information:	21/21 pages passed. Pages 47-66 were evaluated. The large title text (see page 47 for an example) is orange (#DC6623) and only passes for large text, not for small text. The large heading text (see page 47 for an example) and smaller link text, are a blue color (#336699) and pass for both small and large text. All text was evaluate on a white (#F7F7F7) background.
D. Contrast for text passed WCAG AA standards for normal texts (contrast ratio of 4.5:1).	Pass
Additional Information:	21/21 pages passed. Pages 47-66 were evaluated. The regular text is a traditional black color (#000000) and passes for both small and large text. All text was evaluate on a white (#F7F7F7) 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 pass/fail rating can be assigned. No simple images
	were 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:	No pass/fail rating can be assigned. The assistive technology cannot be used to evaluate markup.
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 pass/fail rating can be assigned. The assistive technology cannot be used to evaluate markup.

# 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
Additio	onal Information:	No pass/fail rating can be assigned. The text does not contain either nondecorative or decorative images.
В.	Decorative images are marked with null alternate text or contain markup that allows them to be ignored by assistive technology.	N/A
Additio	onal Information:	No pass/fail rating can be assigned. The text does not contain either nondecorative or decorative images.
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	N/A



player, or reader) that offers this functionality).	
Additional Information:	No pass/fail rating can be assigned. The text does not contain either nondecorative or decorative images.

### 12.Multimedia

A. A synchronized text track (e.g. open or closed captions) is provided with all video content.	N/A
Additional Information:	No pass/fail rating can be assigned. No multimedia was found.
B. A transcript is provided with all audio content.	N/A
Additional Information:	No pass/fail rating can be assigned. No multimedia was 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 pass/fail rating can be assigned. No multimedia was found.

## 13.Flickering

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

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

A. STEM figures have appropriate markup that	N/A
indicates that the image is a figure.	
Additional Information:	No pass/fail rating can be assigned. No STEM content was found.
B. STEM graphs have appropriate markup that indicates that the image is a graph.	N/A



Additional Information:	No pass/fail rating can be assigned. No STEM content was found.
C. STEM equations have appropriate markup that indicates that the image is an equation.	N/A
Additional Information:	No pass/fail rating can be assigned. No STEM content was found.
D. STEM tables have appropriate markup that indicates the image is a table.	N/A
Additional Information:	No pass/fail rating can be assigned. No STEM content was 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 pass/fail rating can be assigned. No STEM content was 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 pass/fail rating can be assigned. No STEM content was 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 pass/fail rating can be assigned. No STEM content was found.
H. Assistive technology used can access the content from the STEM tables.	N/A
Additional Information:	No pass/fail rating can be assigned. No STEM content was 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 pass/fail rating can be assigned. No interactive elements were 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 pass/fail rating can be assigned. No interactive elements were 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 pass/fail rating can be assigned. No interactive elements were 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	Fail
materials has an accessibility statement.	
Additional Information:	No Content Found
C. An Accessibility Evaluation Report is available	Fail
from an external organization.	
Additional Information:	No Content Found.

## 2. Text Access

A. The text of the digital resource is available to	Fail
assistive technology that allows the user to	
enable text-to-speech (TTS) functionality.	
Additional Information:	Pgs 10-21 were checked. The narrator said that the
Additional information.	
	text was not recognized. This happened on all 11
	pages. The Narrator said "unexplorable text."

# 3. Text Adjustment

A. Text is compatible with assistive technology.	Pass
Additional Information:	Pgs 10-21 were checked. Text allowed to adjust the size of the font on all 11 pages.
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).	N/A
Additional Information:	Need Assistive Technology.

# 4. Reading Layout

A. T	Text of the digital resource is compatible with	N/A
а	assistive technology that allows the user to	
re	reflow the text by specifying the margins and	
li	ine spacing (or is rendered by an application	
S	such as a browser, media player, or reader	
tl	hat offers this functionality).	



Additional Information:	Need Assistive Technology.
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 or PDF available to compare.

# 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.	N/A
Additional Information:	Need Assistive Technology.

# 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).	N/A
Additio	onal Information:	Need Assistive Technology.
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
Additio	onal Information:	Need Assistive Technology.
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



Additiona	I Information:	Need Assistive Technology.

## 7. Tables

A. Data tables include markup (e.g. tags or	N/A
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).	
Additional Information:	Need Assistive Technology.
Additional information	

# 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 and did function as links> (Beginning) Pgs 2 (1 link) and 5 (9 links) were checked=(10/10) hyperlinks worked. Ten out of the ten links found in these pages were descriptive enough> (Middle) Pgs 94 (2 links), 95 (1 link), 96 (1 link), and 97 (6 links) were checked=(10/10) all hyperlinks worked. Ten out of the ten links were descriptive enough> (End) Pg 205 was checked=(10/10) all hyperlinks did work. All ten of the within book links were descriptive enough.
B. Live hyperlinks take you to any website or webpages external to the book.	Fail
Additional Information:	20/20 live links worked. Pgs 2 (2 links) and 205 were checked. However, all 20 of these links did were not descriptive enough to tell the user where the link would take them.
C. Live links take you to the correct webpage that is functioning properly.	Pass



Additional Information:	20/20 live links worked. Pgs 2 (2 links) and 205 were checked.
D. Live links are descriptive enough for the users to know where it should take them.	Fail
Additional Information:	0/20 live links had a description. Pgs 2 (2 links) and 205 were checked. All 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 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 10-21 were checked. Information not conveyed by color alone. Size of font was used to convey information. Style of font (underlined, basic print, bold) was used to convey information.
B. Information is conveyed from the sub- categories for contrast.	Pass
Additional Information:	Pgs 10-31 were checked. Most pages had the contrast ratio of 4.51:1 and above (19.3:1). The section titles were larger in size (18+ font size) compared to the rest of the text, were in orange, and were bold. The section titles passed with 3.08:1 considering it was larger than 18 size font. Subsections within a chapter were in blue, were in bold, and with an average ratio of 6.01:1. Underlined text (in this case hyperlinks) in blue passed with a ratio of 6.01:1.
C. Contrast for headers passed WCAG AA standards for large texts (contrast ratio 3:1).	Pass
Additional Information:	Pgs 10-31 were checked. Large chapter headings passed with a ratio of 3.08:1 considering the text was



	larger than size 18 style font. Larger subchapter headings passed with a ratio of 6.01:1.
D. Contrast for text passed WCAG AA standards for normal texts (contrast ratio of 4.5:1).	Pass
Additional Information:	Pgs 10-31 were checked. Most of the text was above the ratio 4.51:1 (19.3:1). The section titles were larger in size compared to the rest of the text. The section titles passed with 3.08:1 (larger than size 18 style font). Undelined text in blue passed with a ratio of 6.01:1. Subsection chapter text were in blue and passed with 6.01:1.
E. Contrast for simple images (for example, images of atoms) passed WCAG AA standards (contrast ratio of 4.5:1).	N/A
Additional Information:	Pgs 1-208 were checked. No Images were 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:	Need Assistive Technology.
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:	Need Assistive Technology.

# 11.Images

A. Non-decorative images have alternative text	N/A
that is compatible with assistive technology	
(or is rendered by an application such as a	
browser, media player, or reader that offers	
this functionality).	
•	



Additional Information:	Did not find any error using the pagina epub checker.  No images were found throughout the book.
B. Decorative images are marked with null alternate text or contain markup that allows them to be ignored by assistive technology.	Fail
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:	No Complex Images found throughout the book.

## 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

-10 were checked. No flickering content
rved.



# 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.
B. STEM graphs have appropriate markup that indicates that the image is a graph.	N/A
Additional Information:	No Stem Content.
C. STEM equations have appropriate markup that indicates that the image is an equation.	N/A
Additional Information:	No Stem Content.
D. STEM tables have appropriate markup that indicates the image is a table.	N/A
Additional Information:	No Stem Content.
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.
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.
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.
H. Assistive technology used can access the content from the STEM tables.	N/A
Additional Information:	No Stem Content.



#### 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.
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.
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.

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