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: **Modern MicroEconomics (Bookboon)**
Format of Textbook: **PDF**

Assistive Technology (AT) Evaluation Score: Overall	4.9 (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	4.5 (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:	**Did not find any information about Bookhorn's formal Accessibility Policy.**
B. The organization providing the online materials has an accessibility statement.	**Fail**
Additional Information:	**Did not find any information about Bookhorn's Accessibility Statement**
C. An Accessibility Evaluation Report is available from an external organization.	**Fail**
Additional Information:	**Did not find any information about Bookhorn'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.	**Fail**
Additional Information:	**0/5 pages were not read properly (Pg. 21, 24, 49, 74, 183). Equations on these pages are not read logically. Figures are not described other than what is provided in the captions. Whole equations are skipped on page 49 and 74. There are also times when the NVDA reader is unable to read the content on the textbook pages with the warning "Alert: Empty Page, this page appears to be empty."**

3. Text Adjustment

A. Text is compatible with assistive technology.	**Fail**
Additional Information:	**0/5 pages were able to zoom in without horizontal scrolling (Pg. 21, 24, 49, 74, 183). These pages were able to zoom in and out, however past 100%, a reader had to horizontally scroll in order to read the content on the page.**
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:	**0/5 pages were not able to adjust colors (Pg. 180, 181, 187, 188, 191). The background and text changed to black and the text changed to green, however 3 pages (Pg. 181, 187, 188) had text that remained black against a black background. The lines on the graphs stayed black, so you were not able to see the lines against a blackbackground (Pg. 180, 187,191).**

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 good reflow of the text.**
B. If the digital resource is an electronic alternative to printed materials, the page numbers correspond to the printed material.	**N/A**
Additional Information:	

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:	**0/5 pages were not read properly (Pg. 21, 24, 49, 74, 183). Equations on these pages are not read logically. Figures are not described other than what is provided in the captions. Whole equations are skipped on page 49 and 74.There are also times when the NVDA reader is unable to read the content on the textbook pages with the warning "Alert: Empty Page, this page appears to be empty."**

6. Structural Markup/Navigation

A. The text of the digital resource includes markup (e.g. tags or styles) that allows for navigation by key structural elements (chapters, headings, pages) using assistive technology (or is rendered by an application such as a browser, media player, or reader that offers this functionality).	**Fail**
Additional Information:	**0/12 pages had headings that were navigable (13, 14, 15, 16, 17, 18, 22, 23, 115, 123, 128, 129). The headings on these pages were not found going from page to page and even when there were multiple headings on one page.**
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 navigable using the NVDA hotkeys (Pg. 93, 97, 99-100, 106,(2), 115, 122, 123, 128, 129).**
C. If the text of the digital resource is delivered within an ebook reader application, a method	**N/A**

is provided that allows users to bypass the reader interface and move directly to the text content that is compatible with assistive technology.	
Additional Information:	

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:	

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:	**The only within book hyperlinks were in the Contents section of the textbook and they all directed the reader to the corresponding locations in the book.**
B. Live hyperlinks take you to any website or webpages external to the book.	**Pass**
Additional Information:	**20/20 hyperlinks were functional, however these were all advertisements (Pg. 3, 8, 14, 20, 23, 26, 33, 36, 39, 42, 45, 48, 51, 54, 57, 60, 63, 66, 69, 72). I did not find any live hyperlinks that were associated with the contents of the textbook. 20/20 hyperlinks were properly described, however these were all advertisements (Pg. 3, 8, 14, 20, 23, 26, 33, 36, 39, 42, 45, 48, 51, 54, 57, 60, 63, 66, 69, 72). I did not find any live hyperlinks that were associated with the contents of the textbook.**

C. Live links take you to the correct webpage that is functioning properly.	**Pass**
Additional Information:	**20/20 hyperlinks were functional, however these were all advertisements (Pg. 3, 8, 14, 20, 23, 26, 33, 36, 39, 42, 45, 48, 51, 54, 57, 60, 63, 66, 69, 72). I did not find any live hyperlinks that were associated with the contents of the textbook.**
D. Live links are descriptive enough for the users to know where it should take them.	**Pass**
Additional Information:	**20/20 hyperlinks were properly described, however these were all advertisements (Pg. 3, 8, 14, 20, 23, 26, 33, 36, 39, 42, 45, 48, 51, 54, 57, 60, 63, 66, 69, 72). I did not find any live hyperlinks that were associated with the contents of the textbook.**

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:	**Headings and text were consistently black against a white background. The links available were consistently blue as on page 3.**
B. Information is conveyed from the sub-categories for contrast.	**Pass**
Additional Information:	**Headings and text were black against a white background.**
C. Contrast for headers passed WCAG AA standards for large texts (contrast ratio 3:1).	**Pass**
Additional Information:	**Headings were black against a white background.**
D. Contrast for text passed WCAG AA standards for normal texts (contrast ratio of 4.5:1).	**Pass**
Additional Information:	**Text was in black against a white background.**

E. Contrast for simple images (for example, images of atoms) passed WCAG AA standards (contrast ratio of 4.5:1).	**Pass**
Additional Information:	**Simple images were graphs that were in black agasint a white background.**

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:	
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:	

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:	**None of the figures found were labeled as figures because the pages were "empty pages" by the NVDA asisstive technology.**
B. Decorative images are marked with null alternate text or contain markup that allows them to be ignored by assistive technology.	**Fail**
Additional Information:	**The only decorative image was on the cover page. However, none of the figures found were labeled as figures because the pages were "empty pages" by the NVDA asisstive technology.**

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:	**None of the figures found were labeled as figures because the pages were "empty pages" by the NVDA asisstive technology.**

12.Multimedia

A. A synchronized text track (e.g. open or closed captions) is provided with all video content.	**N/A**
Additional Information:	
B. A transcript is provided with all audio content.	**N/A**
Additional Information:	
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:	

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.	**Fail**

Additional Information:	**5/10 figures were marked up correctly as figures (Pg. 19, 29, 59, 60, 61) However, the figures on pages 137 and 138 were not labeled as figures.**
B. STEM graphs have appropriate markup that indicates that the image is a graph.	**Fail**
Additional Information:	**0/10 graphs were marked up correctly as graphs. Instead, they were labeled as figures.**
C. STEM equations have appropriate markup that indicates that the image is an equation.	**Pass**
Additional Information:	**10/10 equations were visible in the textbook. There was no problems in the markup.**
D. STEM tables have appropriate markup that indicates the image is a table.	**N/A**
Additional Information:	
E. STEM figures have appropriate notation markup that conveys both the notation (presentation) and meaning (semantics) of the STEM content.	**Fail**
Additional Information:	**None of the figures found were labeled as figures because the pages were "empty pages" by the NVDA asisstive technology.**
F. STEM graphs have appropriate notation markup that conveys both the notation (presentation) and meaning (semantics) of the STEM content.	**Fail**
Additional Information:	**None of the figures found were labeled as figures because the pages were "empty pages" by the NVDA asisstive technology.**
G. STEM equations have appropriate notation markup that conveys both the notation (presentation) and meaning (semantics) of the STEM content.	**Fail**
Additional Information:	**None of the equations found were able to be read aloud because the pages were "Empty pages" by the NVDA assistive technology.**

H. Assistive technology used can access the content from the STEM tables.	**N/A**
Additional Information:	

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:	
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:	
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:	

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:	**Did not find any information about Bookhorn's formal Accessibility Policy.**
B. The organization providing the online materials has an accessibility statement.	**Fail**
Additional Information:	**Did not find any information about Bookhorn's Accessibility Statement.**
C. An Accessibility Evaluation Report is available from an external organization.	**Fail**
Additional Information:	**Did not find any information about Bookhorn'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.	**Fail**
Additional Information:	**0/5 pages were read properly p41-45 checked. Adobe read out load says "warning, empty page" for all pages checked.**

3. Text Adjustment

A. Text is compatible with assistive technology.	**Pass**
Additional Information:	**All text were adjustable in size.**
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:	**All text and background adjusted color to selected green text on black background.**

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:	**The entire book 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:	**No printed material provided, cannot comapre.**

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:	**0/5 pages were not read properly (Pg. 21, 24, 49, 74, 183). Equations on these pages are not read logically. Figures are not described other than what is provided in the captions. Whole equations are skipped on page 49 and 74.There are also times when the NVDA reader is unable to read the content on the textbook pages with the warning "Alert: Empty Page, this page appears to be empty."**

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:	**Passes bookmarks but tagged PDF, Title, and Headings all failed using the accessbiility 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:	**All lists failed by Acc checker.**
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).	**N/A**
Additional Information:	**No table found in the entire book.**

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:	**The only within book hyperlinks were in the Contents section of the textbook and they all directed the reader to the corresponding locations in the book.**
B. Live hyperlinks take you to any website or webpages external to the book.	**Pass**
Additional Information:	**20/20 hyperlinks were functional, however these were all advertisements (Pg. 3, 8, 14, 20, 23, 26, 33, 36, 39, 42, 45, 48, 51, 54, 57, 60, 63, 66, 69, 72). I did not find any live hyperlinks that were associated with the contents of the textbook. 20/20 hyperlinks were properly described, however these were all advertisements (Pg. 3, 8, 14, 20, 23, 26, 33, 36, 39, 42, 45, 48, 51, 54, 57, 60, 63, 66, 69, 72). I did not find any live hyperlinks that were associated with the contents of the textbook.**
C. Live links take you to the correct webpage that is functioning properly.	**Pass**
Additional Information:	**20/20 hyperlinks were functional, however these were all advertisements (Pg. 3, 8, 14, 20, 23, 26, 33, 36, 39, 42, 45, 48, 51, 54, 57, 60, 63, 66, 69, 72). I did not find any live hyperlinks that were associated with the contents of the textbook.**
D. Live links are descriptive enough for the users to know where it should take them.	**Pass**
Additional Information:	**20/20 hyperlinks were properly described, however these were all advertisements (Pg. 3, 8, 14, 20, 23, 26, 33, 36, 39, 42, 45, 48, 51, 54, 57, 60, 63, 66, 69, 72). I did not find any live hyperlinks that were associated with the contents of the textbook.**

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:	**Headings and text were consistently black against a white background. The links available were consistently blue as on page 3.**
B. Information is conveyed from the sub-categories for contrast.	**Pass**
Additional Information:	**Headings and text were black against a white background.**
C. Contrast for headers passed WCAG AA standards for large texts (contrast ratio 3:1).	**Pass**
Additional Information:	**Headings were black against a white background.**
D. Contrast for text passed WCAG AA standards for normal texts (contrast ratio of 4.5:1).	**Pass**
Additional Information:	**Text was in black against a white background.**
E. Contrast for simple images (for example, images of atoms) passed WCAG AA standards (contrast ratio of 4.5:1).	**Pass**
Additional Information:	**Simple images were graphs that were in black agasint a white background.**

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:	**ACC checker failed primary language.**
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:	**No second language 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**
Additional Information:	**None of the figures found were labeled as figures because the pages were "empty pages" by the NVDA asisstive technology.**
B. Decorative images are marked with null alternate text or contain markup that allows them to be ignored by assistive technology.	**Fail**
Additional Information:	**The only decorative image was on the cover page. However, none of the figures found were labeled as figures because the pages were "empty pages" by the NVDA asisstive technology.**
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:	**None of the figures found were labeled as figures because the pages were "empty pages" by the NVDA asisstive technology.**

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 content.**

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

A. STEM figures have appropriate markup that indicates that the image is a figure.	**Fail**
Additional Information:	**5/10 figures were marked up correctly as figures (Pg. 19, 29, 59, 60, 61) However, the figures on pages 137 and 138 were not labeled as figures.**
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, refer to figure.**
C. STEM equations have appropriate markup that indicates that the image is an equation.	**Pass**
Additional Information:	**0/10 equations were labeled as equation.**
D. STEM tables have appropriate markup that indicates the image is a table.	**N/A**
Additional Information:	**No table founf in the entire book.**
E. STEM figures have appropriate notation markup that conveys both the notation	**Fail**

(presentation) and meaning (semantics) of the STEM content.	
Additional Information:	**None of the figures have good descriptions.**
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, 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:	**None of the equations were read completely correctly.**
H. Assistive technology used can access the content from the STEM tables.	**N/A**
Additional Information:	**No table founf in the entire book.**

15. Interactive Elements

A. Each interactive element (e.g. menu, hyperlink, button) and function (e.g. annotations) allows keyboard-only operation both with and without assistive technology.	**N/A**
Additional Information:	**No interactive 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	**N/A**

by an application such as a browser, media player, or reader that offers this functionality).	
Additional Information:	**No interactive elements.**

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