

The Durham Beamer Theme

A Teaching-Centred Presentation System for Lectures

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Outline

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Motivation

What is PDF tagging?

PDF tagging adds a hidden structure layer to the PDF so assistive technologies can follow the correct reading order and understand document elements.

Tagged PDFs typically encode:

- headings and sections,
- paragraphs,
- lists and list items,
- links and references.

How this slide is tagged cleanly:

- it uses standard Beamer structures (title + paragraphs + itemize),
- it contains no overlay duplication mechanisms,
- the PDF structure tree can map these elements in order.

Beamer Presentation Ecosystem

Beamer already has a rich and well-established ecosystem in academia:

- a wide range of themes,
- a strong structural model for presentations,
- excellent support for mathematics and technical content.

It remains the default tool for many lecturers and researchers.

What was missing in practice

Despite this richness, sustained teaching use revealed recurring issues:

- themes optimised for *slides*, not for *lectures*,
- navigation elements that compete with content rather than support it,
- visual noise accumulating over long teaching sessions,
- limited support for pacing, time awareness, and audience orientation.

Most importantly, accessibility considerations were often absent or implicit.

Teaching as the primary use case

In teaching contexts, presentations function differently:

- lectures unfold over time rather than as standalone slides,
- students benefit from a sense of structure and progress,
- visual consistency reduces cognitive load,
- accessibility is not optional, but integral to inclusive teaching.

This project began with the question: *What would Beamer look like if it were designed first and foremost for teaching?*

Development

Development philosophy

The Durham theme was developed from scratch, guided by three principles:

- content should dominate the slide, not decoration,
- navigation should support orientation without distraction,
- visual decisions should scale across long lecture sequences.

Rather than extending an existing theme, each element was reconsidered independently.

Universal Design for Learning as a motivator

A key influence was the idea of **Universal Design for Learning (UDL)**:

- provide multiple means of representation,
- reduce unnecessary barriers to engagement,
- allow flexibility in how material is presented and consumed.

The theme aims to give lecturers control over presentation modes without fragmenting workflows.

From experience to design

Design choices were informed by:

- repeated use in undergraduate and postgraduate lectures,
- long sessions with dense quantitative material,
- the need to balance structure with visual calm.

The result is not stylistic novelty, but a system shaped by real teaching constraints.

Implementation

Implementation overview

The Durham theme implements a small number of deliberate structural elements:

- sections treated explicitly as lecture chapters,
- a headline that indicates the current position in the lecture,
- a progress indicator to support pacing and time awareness,
- a restrained footnote for contextual information.

Sections as lecture chapters

Sections are designed to function as conceptual chapters:

- each section opens with a dedicated section page,
- students are signposted when the lecture moves to a new topic,
- the structure remains visible without interrupting flow.

This reinforces narrative continuity across long teaching sessions.

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Headline and orientation

The headline provides lightweight orientation:

- shows the current section in context,
- avoids visual competition with slide content,
- remains consistent across the lecture.

The intention is not navigation for navigation's sake, but reassurance of structure.

Progress and time awareness

The vertical progress indicator serves two roles:

- it gives students a sense of how the lecture is unfolding,
- it helps lecturers manage pacing and time allocation.

Importantly, it remains visually quiet and does not rely on colour alone.

Footline as contextual metadata

The footnote is intentionally minimal:

- short title and author for orientation,
- no duplication of information already present elsewhere,
- can be disabled entirely when distraction-free modes are preferred.

Colour palette and institutional feel

The default colour palette is inspired by Durham University:

- chosen to convey a calm institutional aesthetic,
- consistent with sustained reading and projection.

However:

- this is **not** an official university theme,
- it does not use any trademarks or protected branding,
- documentation explicitly clarifies this distinction.

Subsections without visual penalty

This slide intentionally introduces a subsection to illustrate a design choice.

In the Durham theme:

- the subsection indicator appears *only when a subsection exists*,
- no reserved or shaded space is shown otherwise,
- vertical space is returned to the content when subsections are absent.

This avoids persistent visual placeholders and returns scarce vertical space to content when structure is not needed.

Accessibility

Accessibility options

- The Durham theme includes optional modes to support:
 - ▶ high-contrast viewing (colour-vision impairment),
 - ▶ distraction-free reading (cognitive load),
 - ▶ reduced visual fatigue (dark background preference).
- All modes are opt-in via theme options (comma-separated).

Usage pattern:

- `\usetheme[<options>]{Durham}`

Mode 1: accessibility (high contrast, B&W)

- Switches the palette to black-and-white (high contrast).
- Avoids colour-only cues (better for colour-vision deficiencies).
- Keeps the theme structure intact (headline/footline/progress).

Enable:

```
\usetheme[accessibility]{Durham}
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Mode 2: plain (distraction-free)

- Hides UI elements:
 - ▶ headline, footline, progress indicators.
- Leaves only the slide content for maximum focus.
- Useful for dense reading, handouts, or reduced cognitive load.

Enable:

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\usetheme[plain]{Durham}
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Figure: Plain Mode

Mode 3: plain, accessibility (minimal + B&W)

- Combines:
 - ▶ plain (removes UI elements),
 - ▶ accessibility (black text on white background).
- A clean reading mode with high-contrast text.

Enable:

```
\usetheme[plain,accessibility]{Durham}
```

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```

Figure: Plain+Accessibility Mode

Mode 4: plain,accessibility,invert (minimal + dark)

- A dark reading mode for users uncomfortable with bright backgrounds.
- Combines:
 - ▶ plain: removes headline/footline/progress,
 - ▶ accessibility: enforces high contrast,
 - ▶ invert: black background with white text.

Enable:

```
\usetheme[plain,accessibility,invert]{Durham}
```

Mode 4: plain,accessibility,invert (minimal + dark)

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Figure: Plain+Accessibility+Invert Mode

Accessibility note

- These options address **visual accessibility**: contrast, colour dependence, and reading comfort.
- For **screen readers / tagged PDF**, Beamer output can be limited by the current PDF tagging toolchain.
- Within these constraints, the theme addresses the aspects of accessibility that are realistically controllable at the theme level.
- Best practice (when required): provide an accessible companion output (e.g., detailed notes or a tagged handout) alongside slides.

Conclusion

Content-first approach

The Durham Beamer theme represents:

- a shift from slide-centric to lecture-centric design,
- an explicit focus on pedagogy rather than aesthetics,
- a practical response to accessibility and inclusivity.

Outcome and reflection

Rather than offering a single visual style, the theme provides:

- a coherent presentation system,
- adaptable modes for different teaching contexts,
- a structure that supports both lecturers and students.

It demonstrates how careful design of presentation technology can support teaching practice.

Closing thought

Good teaching tools should:

- stay out of the way of content,
- respect the diversity of learners,
- and support, rather than dictate, pedagogy.

The Durham theme is a small but deliberate step in that direction.

Thank you!