# **Cover Page**

This is a cover page.

TEX101: Introduction to FAST Template

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# FAST

LaTEX Template

#### Abstract

This template demonstrates the baseline structure for FAST – the Coursework LaTeX toolkit focused on being Fast, Accessible, Stylish, and equipped as a Toolkit. Replace this text with your assignment abstract or a short summary of the work.

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Introduction TEX101

#### 1 Introduction

This coursework template provides a clean starting point for producing reports and assignments using LaTeX.

It demonstrates a modular structure where metadata, configuration, and content live in clearly separated files.

Please confirm if \( \mathbb{L}T\_{EX} \) is acceptable for use with the module leader in advance.

#### 1.1 Subsection Example

This section is designed to test the styling of subsections and subsubsections. You can also find the updated TOC (Table of Contents).

#### 1.1.1 Subsubsection Example

**TODO:** If you notice me, you find the first customized command, \todo{}. You may use it to remind yourself of things to do.

#### 2 Mathematics

Or display full equations on their own line by using  $\[\dots\]$  or classically, using  $\$  ...\$ like these:

$$\nabla \cdot \mathbf{E} = \frac{
ho}{\epsilon_0}$$

$$\int_a^b f(x) \, \mathrm{d}x = F(b) - F(a)$$

If you want to number equations for referencing, use the equation environment:

$$\sum_{i=1}^{n} \vec{F}_i = m \cdot \vec{a} \tag{1}$$

For multi-line derivations, use the align environment:

$$E = mc^2, (2)$$

$$\frac{\mathrm{d}}{\mathrm{d}t} \int_{V} \rho \,\mathrm{d}V = -\int_{S} \rho \vec{v} \cdot \mathrm{d}\vec{S}. \tag{3}$$

Figures TEX101

## 3 Figures

Figure insertion is another basic and essential feature of LaTeX. However, the default syntax is quite verbose and not very user-friendly.

That's why **FAST** introduces some custom commands to simplify the process! 2 customized commands are provided for convenience.

#### 3.1 \picHere: Full-featured figure insertion

\picHere wraps a full figure environment with caption and label support (4 arguments are required). (Figure 1 is an example.)

The following snippet and its output demonstrate how to use it:

\picHere{assets/images/github-icon.png}{0.8\textwidth}{Example figure included from external asset.}{fig:example-figure}

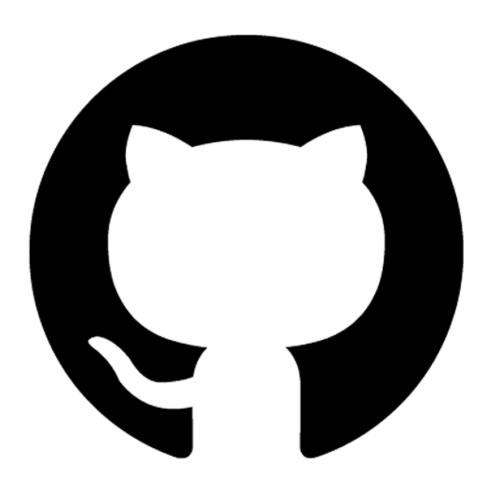


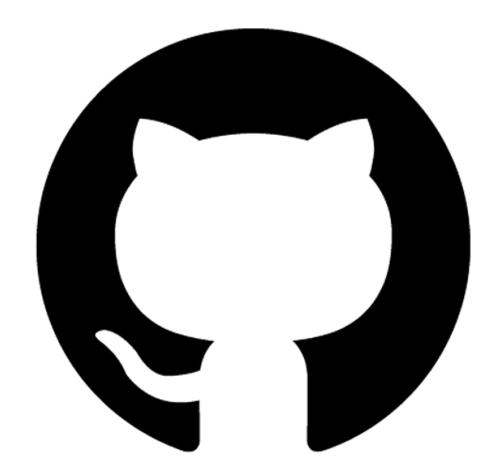
Figure 1: Example figure included from external asset.

#### 3.2 \picHereSimple: Minimal decorative figure insertion

While \picHereSimple is a minimal drop-in for decorative images that do not require referencing. (No caption or label, just the image.)

The following snippet and its output demonstrate how to use it:

\picHereSimple{assets/images/github-icon.png}{0.8\textwidth}



Tables TEX101

#### 4 Tables

Table, another essential feature of L<sup>A</sup>T<sub>E</sub>X, is supported via the **booktabs** package for better aesthetics. (Yes, the academic journal style!)

Refer to Table 1 for a simple booktabs example.

Table	1.	Summary	$\circ f$	template	goals
Table	т.	Dummay	$O_{\rm I}$	ocmpiace	goais.

Goal	Description
FAST	Core — Quick compilation!
Accessible	Ready to use out of the box, easy to get started!
Stylish	Beautiful, no words needed!
Toolkit	Suitable for CW, practical, and sufficient!

### 5 Code Listings

Source code is rendered using the listings package with the default style defined in config/style.tex. Adjust \TemplateCodeListingStyle in options.tex to point to a different style.

Listing 1 demonstrates an inline listing embedded directly in the document for short examples. The more extensive Python and C++ modules now live in Appendix A.1, keeping the main narrative focused while still providing full source listings for reference.

Listing 1: Running total helper implemented in modern JavaScript.

```
export function runningTotal(values) {
  let total = 0;
  return values.map((value) => {
    total += value;
    return total;
  });
}

console.log(runningTotal([4, 8, 15, 16, 23, 42]));
```

## 6 Referencing (not References!)

Manage bibliography entries in bib/references.bib. The template uses biblatex with the biber backend for flexible citation styles.

You just need to use \cite to cite a reference [1]. And this command also support citing multiple references at once [1, 2, 3].

References TEX101

# References

[1] Donald E. Knuth. The TeXbook. Reading, MA: Addison-Wesley, 1990.

- [2] Sirius Ahu. "A Sample In<br/>Book". In: ed. by Sirius Ahu. Some Publisher, 2023. Chap. 1, pp. 1–10.
- [3] Sirius Ahu. "A Sample Article". In: Some Journal 42.1 (2023).

## A Appendix Example

Appendices are input after \appendix is declared in main.tex. Use this space for supplementary derivations, raw data, or extended proofs that support the main text.

#### A.1 Supplementary Code Listings

The full Python and C++ utilities referenced in listing 1 are provided here for completeness.

Listing 2: Python helper for computing descriptive statistics.

```
from statistics import median
2
3
  def describe(values: list[float]) -> tuple[float, float]:
4
      mean = sum(values) / len(values)
5
       return mean, median(values)
6
7
8
  if __name__ == "__main__":
9
       mean, med = describe([4, 8, 15, 16, 23, 42])
10
       print(f"mean={mean:.2f}, median={med}")
11
```

Listing 3: C++ program computing the arithmetic mean of a sample.

```
#include <iostream>
  #include <numeric>
  #include <vector>
4
  double mean(const std::vector<int>& data) {
       return std::accumulate(data.begin(), data.end(), 0.0) / data.size();
6
7
  }
8
  int main() {
9
       const std::vector<int> samples{4, 8, 15, 16, 23, 42};
10
       std::cout << "mean=" << mean(samples) << '\n';</pre>
11
  }
12
```

#### A.2 Just some text

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A.2 Just some text TEX101

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