

# Demo of Hassium Style

*Hassium*

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## 1 Packages

This style contains the following packages:

```
\usepackage[T1]{fontenc}
\usepackage[explicit]{titlesec}
\usepackage[utf8]{inputenc}
\usepackage{amsmath,amsthm,amssymb,amsfonts,mathrsfs,mathtools,nicematrix,chgcntr,
centernot,ytableau,tikz-cd}
\usepackage{imakeidx,textcomp,tocloft,envIRON,setspace,geometry,enumerate,
enumitem,blindtext,multicol,xcolor,fancyhdr,calligra,graphicx,
wrapfig,pgfplots,mdframed,tabularx,lipsum,comment,csquotes,verbatim}
\usepackage[hidelinks]{hyperref}
\usepackage{chemfig}
```

How to insert it?

```
\documentclass{article} % This style only has commands on \section
\input{hassium.tex} % Download and input it using its path
```

## 2 Title Page Setup

After inserting the package, you should define the title and author name. Here is an example, which is the code of this demo:

```
\documentclass{article}
\input{hassium.tex}
\begin{document}
  \def\htitle{Demo of Hassium Style}
  \def\hauthor{Hassium}
  \hsetup\
  \htoc\
```

```
\hmain\  
\end{document}
```

### 3 General Geometry

There are some commands that adjust the geometry of the document:

```
\geometry{letterpaper, margin=0.75in}  
\setstretch{1.25} % spacing  
\setlength{\headheight}{13pt}
```

### 4 More on Table of Contents

You can add descriptions to each section and the description will appear in the table of contents, directly below the section name:

```
\section{This is a Sample Section}  
\descr{This is a description to the section}
```

The table of contents only shows the section names, but no subsections and numberless sections. If you want a numberless section in the table of contents, use the “newsection” command:

```
\newsection{This is a numberless section}
```

Note that the section names in the table of contents are hyperlinks; click on any section name to navigate directly to that section. You can do the converse to navigate to the first page as well.

### 5 Index Page

This style has a customized index page. Check the code:

```
This is a \hdef{defintiion}. This is another \hdef{vocabulary}.  
\hindex
```

The command “hdef” mark the word and print it. The command “hindex” is a customized index page that print words in three columns. Each page number in the index page contains a hyperlink, you can click it to locate that page.

### 6 Darkmode

Darkmode command changes the background color to black and the text to white. The normal mode is used to end the darkmode. Use the commands by:

```
\begin{document}  
  \darkmode  
  \normalmode  
\end{document}
```

## 7 Other Environments and Commands

The line-spacing in “enumerate” environment is changed:

```
\setlist[enumerate]{topsep=0pt,itemsep=-1ex,partopsep=1ex,parsep=1ex}
```

The “level” environment is used in “enumerate” environment, consider the following code:

```
\begin{enumerate}
  \item This is the first line.
  \begin{level}
    \item This is the second line.
    \begin{level}
      \item This is the third line.
    \end{level}
  \end{level}
  \item This is another line.
\end{enumerate}
```

This code gives:

1. This is the first line.
2. This is the second line.
3. This is the third line.
4. This is another line.

The command “circled” draws a small circle and you can add something inside the circle:

```
\circled{1}
```

The output is ①. You can write any Roman numerals by:

```
\rom2024 % replace 2024 by any number you want
```

There are two simple commands for hand-written fonts:

```
\cfd{font 1}
\cfc{font 2}
```

The outputs are *font 1* and *font 2*.

## 8 Quiver

Quiver is done by varkor and AndréC, check their github for more information. I include quiver to draw curve arrows in a commutative diagram. To draw a diagram with quiver, check this website. An example is given below:

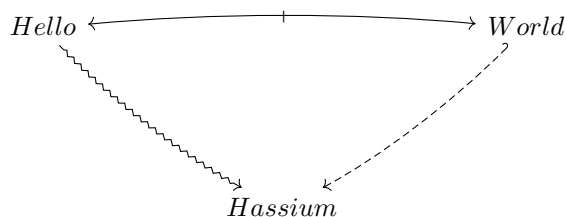
```
% chktex-file 15 % the three lines enables useless warnings
% chktex-file 17
% chktex-file 18
\begin{center}
  \begin{tikzcd}
    \text{Hello} & \text{&&& World} \\
  \end{tikzcd}
\end{center}
```

```

\\
&& Hassium
\arrow["\shortmid"{marking}, curve={height=-6pt}, tail reversed, from=1-1, to=1-5]
\arrow[curve={height=6pt}, squiggly, from=1-1, to=4-3]
\arrow[curve={height=-6pt}, dashed, hook', from=1-5, to=4-3]
\end{tikzcd}
\end{center}

```

The diagram looks like:



## 9 Theorem Styles

Several theorem styles are offered:

```

\theoremstyle{definition}
\newtheorem{definition}{Definition}[section]
\newtheorem{theorem}{Theorem}[section]
\newtheorem*{proposition}{Proposition}
\newtheorem*{lemma}{Lemma}
\newtheorem*{corollary}{Corollary}
\newtheorem*{example}{Example}
\newtheorem*{remark}{Remark}
\newtheorem*{notation}{Notation}

```

The environment name can be customized by using:

```

\customtheorem{This is a custom theorem}
\begin{This is a custom theorem}
    The proof is trivial.
\end{theorem}

```

The output environment is:

**This is a custom theorem.** The proof is trivial.

You can put any number or label in “exercise” environment:

```

\begin{exercise}[8.6]
    The proof is trivial.
\end{exercise}

```

The environment looks like:

**Exercise 8.6.** The proof is trivial.

## 10 Invisible Proofs

The environment “reviewmode” is originally done by my friend ETwilight. It replaces your “proof” environment by three empty lines:

```
\begin{reviewmode}
  \begin{proof}
    The proof is trivial.
  \end{proof}
\end{reviewmode}
```

## 11 Simple Commands in Math Mode

I will give a table of all commands in math mode.

<code>\bs</code>	<code>\</code>	<code>\vt</code>	$\varnothing$
<code>\N</code>	$\mathbb{N}$	<code>\ve</code>	$\varepsilon$
<code>\Z</code>	$\mathbb{Z}$	<code>\ua</code>	$\uparrow$
<code>\Q</code>	$\mathbb{Q}$	<code>\da</code>	$\downarrow$
<code>\R</code>	$\mathbb{R}$	<code>\Ra</code>	$\Rightarrow$
<code>\C</code>	$\mathbb{C}$	<code>\La</code>	$\Leftarrow$
<code>\bb{H}</code>	$\mathbb{H}$	<code>\Ua</code>	$\Uparrow$
<code>\ca{H}</code>	$\mathcal{H}$	<code>\Da</code>	$\Downarrow$
<code>\fr{H}</code>	$\mathfrak{H}$	<code>\nRa</code>	$\nRightarrow$
<code>\T</code>	$\mathcal{T}$	<code>\nLa</code>	$\nLeftarrow$
<code>\Pn{1}</code>	$\mathbb{P}^1$	<code>\hra</code>	$\hookrightarrow$
<code>\CP{1}</code>	$\mathbb{CP}^1$	<code>\hla</code>	$\hookleftarrow$
<code>\RP{1}</code>	$\mathbb{RP}^1$	<code>\lt</code>	$\rightsquigarrow$
<code>\Sym</code>	$\mathrm{Sym}$	<code>\mt</code>	$\mapsto$
<code>\GL</code>	$\mathrm{GL}$	<code>\rat</code>	$\rightharpoonup$
<code>\SL</code>	$\mathrm{SL}$	<code>\lat</code>	$\leftrightsquigarrow$
<code>\Mod</code>	$\mathrm{Mod}$	<code>\thra</code>	$\twoheadrightarrow$
<code>\Sg</code>	$\mathfrak{S}$	<code>\thla</code>	$\leftarrow$
<code>\Ag</code>	$\mathfrak{A}$	<code>\bij</code>	$\rightsquigarrow$
<code>\Cay</code>	$\mathrm{Cay}$	<code>\wb{A}</code>	$\overline{A}$
<code>\uni</code>	$\exists !$	<code>\id</code>	$\mathrm{id}$
<code>\al</code>	$\alpha$	<code>\sub</code>	$\subset$
<code>\be</code>	$\beta$	<code>\sube</code>	$\subseteq$
<code>\ga</code>	$\gamma$	<code>\supe</code>	$\supseteq$
<code>\de</code>	$\delta$	<code>\nsub</code>	$\not\subset$
<code>\ep</code>	$\epsilon$	<code>\nsup</code>	$\not\supset$
<code>\si</code>	$\sigma$	<code>\nsube</code>	$\not\subseteq$
<code>\la</code>	$\lambda$	<code>\nsupe</code>	$\not\supseteq$
<code>\ka</code>	$\kappa$	<code>\subn</code>	$\subsetneq$
<code>\om</code>	$\omega$	<code>\supn</code>	$\supsetneq$
<code>\vp</code>	$\varphi$	<code>\es</code>	$\emptyset$

<code>\sm</code>	$\backslash$	<code>\im</code>	$\mathrm{im}$
<code>\ps</code>	$\mathcal{P}$	<code>\norm{M}</code>	$\ M\ $
<code>\Un</code>	$\bigcup$	<code>\po</code>	$\preceq$
<code>\In</code>	$\bigcap$	<code>\cyc{g}</code>	$\langle g \rangle$
<code>\Du</code>	$\sqcup$	<code>\Spec</code>	$\mathrm{Spec}$
<code>\cp</code>	$\amalg$	<code>\Syl</code>	$\mathrm{Syl}$
<code>\Cp</code>	$\coprod$	<code>\iso</code>	$\approx$
<code>\ot</code>	$\otimes$	<code>\niso</code>	$\not\approx$
<code>\op</code>	$\oplus$	<code>\Mor</code>	$\mathrm{Mor}$
<code>\acts</code>	$\curvearrowright$	<code>\Aut</code>	$\mathrm{Aut}$
<code>\Span</code>	$\mathrm{span}$	<code>\End</code>	$\mathrm{End}$
<code>\sgn</code>	$\mathrm{sgn}$	<code>\Hom</code>	$\mathrm{Hom}$
<code>\nsg</code>	$\trianglelefteq$	<code>\Inn</code>	$\mathrm{Inn}$
<code>\defa</code>	$:=$	<code>\Out</code>	$\mathrm{Out}$
<code>\sdp</code>	$\rtimes$	<code>\Iso</code>	$\mathrm{Iso}$
<code>\inv{f}</code>	$f^{-1}$	<code>\Ob</code>	$\mathrm{Ob}$
<code>1\mod 2</code>	$1 \bmod 2$	<code>\cop{C}</code>	$C^{op}$
<code>\Cl</code>	$\mathrm{Cl}$	<code>\tri</code>	$\triangle$
<code>\Hol</code>	$\mathrm{Hol}$	<code>\pa</code>	$\partial$
<code>\comp</code>	$\circ$	<code>\hb</code>	$\hbar$
<code>\Gal</code>	$\mathrm{Gal}$	<code>\Ann</code>	$\mathrm{Ann}$
<code>\card{S}</code>	$ S $		

## 12 Acknowledgement

Special thanks to  $\mathcal{FSG}$ ; his advice on style has been invaluable.