

## RESEARCH ARTICLE

How to use the Company of Biologists (DEV) L<sup>A</sup>T<sub>E</sub>X classFirst author<sup>1</sup> and Second author<sup>2</sup>

## ABSTRACT

This sample is a guideline for preparing technical papers using L<sup>A</sup>T<sub>E</sub>X. It contains the documentation for a L<sup>A</sup>T<sub>E</sub>X class file that creates the correct manuscript layout for any of the Company of Biologists journals: Development, Journal of Cell Science, Journal of Experimental Biology, Biology Open or Disease Models and Mechanisms. This sample file uses a class file named `COB.cls`, which authors should use during manuscript preparation.

**KEYWORDS:** keyword entry 1, keyword entry 2, keyword entry 3

## INTRODUCTION

This latex class file is available for authors to prepare their manuscript for submission to any of our journals. It is assumed that authors are familiar with either plain T<sub>E</sub>X, L<sup>A</sup>T<sub>E</sub>X, A<sub>M</sub>S-T<sub>E</sub>X or a standard latex set-up and therefore only the essential points are described in this document. For more details, please go through the *L<sup>A</sup>T<sub>E</sub>X User's Guide* or *The not so short introduction to L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub>* (which is available online). The `COB.cls` file is similar to the `article.cls` of L<sup>A</sup>T<sub>E</sub>X, with only a few additional changes in the preamble.

## INSTALLATION

The `COB.cls` has to be copied into a directory where tex looks for input files. The other files should be kept for reference during the preparation of your manuscript. Please use pre-defined commands for title, authors, address, abstract, keywords, body etc. as shown in Box 1.

## HOW TO START USING COB.CLS

Before you type anything that actually appears in the paper you need to include a `\documentclass{COB}` command at the very beginning and then, the two commands that have to be part of any latex document, `\begin{document}` at the start and the `\end{document}` at the end of your paper.

Please use the respective option in the `\documentclass` command to get the appropriate journal name in the header.

<i>Development</i>	<code>\documentclass[DEV]{COB}</code>
<i>Journal of Cell Science</i>	<code>\documentclass[JCS]{COB}</code>
<i>Journal of Experimental Biology</i>	<code>\documentclass[JEB]{COB}</code>
<i>Biology Open</i>	<code>\documentclass[BIO]{COB}</code>
<i>Disease Models and Mechanisms</i>	<code>\documentclass[DMM]{COB}</code>

The main structure of your document should be as follows:

## Box 1: Structure of a document.

```
\documentclass[DEV]{COB} %%% For double column layout.

%%% If you want the article to display in a single column, then please use
%%% the option "onecolumn" in the document class command as shown below

%%% \documentclass[onecolumn]{COB}
```

<sup>1</sup>First author address

<sup>2</sup>Second author address

Authors for correspondence: First author  
xxxx@xxxx.xxx.xx

```

\begin{document}

\title{How to use the COB \LaTeX\ class}

\author{First author$^{1}$ and Second author $^{2}$}

\address{\add{1}{First author address}
\add{2}{Second author address}}

\corres{(\email{xxxx@xxxx.xxx.xx}; \email{xxxx@xxxx.xxx.xx})}

\maketitle

\begin{abstract}
.....
\end{abstract}

\keywords{keyword entry 1, keyword entry 2, keyword entry 3}

\section{....}
...
\subsection{....}
....
\end{document}

```

## PREAMBLE

All the options in `article.cls` are available with this class file, by default it will produce all elements single spaced throughout the document.

By default, `COB.cls` will produce an unnumbered bibliography.

## LINE NUMBERS

By default, we have used the exact line number option in the template. However, if spanned equations are included using `widextext_TT.sty` then the author should use the option `vruler` in the `\documentclass` command.

### For example:

```
\documentclass[vruler,DEV]{COB}
```

## MANUSCRIPT TITLE

The manuscript title is entered using: `\title{...}` in the standard LATEX manner. Line breaks `\\` may be used to equalize the length of the title lines.

## AUTHOR NAMES

The name and associated information are entered using the `\author` command. `\author` behaves slightly differently depending on the document mode. For more details about author information see Box 1.

## ABSTRACT & KEYWORDS

The abstract is generally the first part of a paper. The abstract text is placed within the abstract environment.

Keywords should be inserted immediately after the abstract text with grouping as shown below.

```

\begin{abstract}
Abstract text here
\end{abstract}

\keywords{Keyword text here}

```

## BODY

### Sections

The sectioning commands are `\section`, `\subsection`, `\subsubsection`, `\paragraph` and `\subparagraph`. By default, `COB.cls` will produce an unnumbered heading.

## FIGURES AND TABLES

Use the default  $\LaTeX$  coding for figures and tables. Figure and table environments should be inserted after the end of the paragraph, nearest to the citation.

The coding for a figure is:

```
\begin{figure}
\includegraphics{sample}
\caption{Insert figure caption\label{fig1}}
\end{figure}
```

An example of a double column floating figure using two subfigures. (The subfig.sty package was already included in the class file.) The subfigure `\label` commands are set within each subfloat command, the `\label` for the overall figure must come after `\caption`. `\hfil` must be used as a separator to get equal spacing. The subfigure.sty package works much the same way, except `\subfigure` is used instead of `\subfloat`.

```
\begin{figure*}[!t]
\centering
\subfloat[Case I]{\includegraphics[width=3in]{Sample_Fig1.eps}\label{fig_first_case}}%
\hskip3pc
\subfloat[Case II]{\includegraphics[width=3in]{Sample_Fig1.eps}\label{fig_second_case}}%
\caption[] {Sample sub figures in \LaTeX}
\label{fig_sim}
\end{figure*}
```

The coding for a table is:

```
\begin{table}[!t]
\processtable{Insert table caption her\label{tab1}}
{\begin{tabular*}{\textwidth}{@{\extracolsep{\fill}}l l l l l@{}}
\hline
\TCH{Column head 1} & \TCH{Column head 2} & \TCH{Column head 3} & & \\
\TCH{Column head 4} & \TCH{Column head 5} & \\\
\hline
Table body & Table body & Table body & Table body & Table body & \\\
Table body & Table body & Table body & Table body & Table body & \\\
Table body & Table body & Table body & Table body & Table body & \\\
Table body & Table body & Table body & Table body & Table body & \\\
Table body & Table body & Table body & Table body & Table body & \\\
\end{tabular*}}{}
\end{table}
```

As always with  $\LaTeX$ , the `\label` must be after the `\caption`, and inside the figure or table environment. The reference for figures and tables inside text can be made using the `\ref{key}` command.

## EQUATIONS

Equations are used in the same way as described in the  $\LaTeX$  manual. Equations are numbered consecutively, with equation numbers in parentheses flush right.

For example, if you type

```
\begin{equation}\label{eq1}
\int_0^{r_2} F(r, \varphi) \mathrm{d}r \mathrm{d}\varphi = [\sigma r_2 / (2\mu_0)] \int_0^\infty \exp(-\lambda |z_j - z_i|) \lambda^{-1} J_1(\lambda r_2) J_0(\lambda r_i) \mathrm{d}\lambda
\end{equation}
```

then you will get the following output:

$$\int_0^{r_2} F(r, \varphi) \mathrm{d}r \mathrm{d}\varphi = [\sigma r_2 / (2\mu_0)] \int_0^\infty \exp(-\lambda |z_j - z_i|) \lambda^{-1} J_1(\lambda r_2) J_0(\lambda r_i) \mathrm{d}\lambda \quad (1)$$

$\mathcal{A}\mathcal{M}\mathcal{S}\text{-}\LaTeX$  has several environments that make it easier to typeset complicated multiline displayed equations. These are explained in the  $\mathcal{A}\mathcal{M}\mathcal{S}\text{-}\LaTeX$  User Guide. A `subequation` environment is available to create equations with sub-numbering of the equation counter. It takes one (optional) argument to specify the way that the sub-counter should appear.

## SPANNING EQUATIONS

In order to span the equations across two columns, please use the command `\begin{widetext} . . . \end{widetext}` command as shown below:

```

\begin{widetext}
\begin{align} \label{d24} \quad x_{\sigma+1} &= x_{\sigma} + \left( \frac{1-\alpha(t_{\sigma})}{M[\alpha(t_{\sigma})]} + \frac{3h\alpha(t_{\sigma})}{2M[\alpha(t_{\sigma})]} \right) \\
&\quad \left( -bx(t_{\sigma-m_1}) + a \sin [cx(t_{\sigma-m_2})] \right) - \left( \frac{1-\alpha(t_{\sigma})}{M[\alpha(t_{\sigma})]} + \frac{h\alpha(t_{\sigma})}{2M[\alpha(t_{\sigma})]} \right) \\
&\quad \times \left( -bx(t_{\sigma-m_1}) + a \sin [cx(t_{\sigma-m_2})] \right).
\end{align}
\end{widetext}

```

Also include the package `\usepackage{widetext-TI}` in the preamble.

## QUOTES AND DISPLAYED TEXT

Quotes are indented from the left and right margins. There are various types of quotes: short quote, long quote and display poetry.

The coding for a short quote is `\begin{quote}...\end{quote}`.

This is a short quotation. It consists of a single paragraph of text. See how it is formatted.

The coding for a long quote is `\begin{quotation}...\end{quotation}`.

This is a longer quotation. It consists of two paragraphs of text, neither of which are particularly interesting.

This is the second paragraph of the quotation. It is just as dull as the first paragraph.

## LISTINGS

Another frequently displayed structure is a list. There are various types of list: numbered, itemized and bulleted. To create a bulleted list use the following:

```
\begin{itemize}
\item Bulleted list 1
\item Bulleted list 2
\item Bulleted list 3
\end{itemize}
```

To create a numbered list use the following:

```
\begin{enumerate}
\item Numbered list 1
\item Numbered list 2
\item Numbered list 3
\end{enumerate}
```

To create a description list use the following:

```
\begin{description}
\item Description list 1
\item Description list 2
\item Description list 3
\end{description}
```

### ENUNCIATIONS LIKE THEOREM, LEMMA ETC.

The  $\mathcal{A}\mathcal{M}\mathcal{S}$ - $\text{\LaTeX}$  package for enunciations (amsthm.sty) has been already loaded in the class file.

To get the theorem environment use the following:

```
\begin{theorem}
Theorem text. Theorem text. Theorem text.
Theorem text. Theorem text. Theorem text.
\end{theorem}
```

and `\newtheorem{theorem}{Theorem}` in the preamble.

Similarly, we can define for lemma, corollary, proposition, definition etc.

## CROSS-REFERENCING

LATEX provides the following commands for cross referencing

```
\label{marker}, \ref{marker} and \pageref{marker}
```

where marker is an identifier chosen by the user. LATEX replaces `\ref` by the number of the section, subsection, figure, table, or theorem after which the corresponding `\label` command was issued. `\pageref` prints the page number of the page where the `\label` command occurred.

## CITATIONS

Citations are made with the `\cite`, `\citep`, `\citet` command as usual. In this class file we have used `natbib.sty` for cross references and reference style.

For bibliography the `natbib` package has been defined in the template as `\usepackage[authoryear]{natbib}` with `\bibpunct[, ]{({})}{;}{a}{,}{;}` command

For more details about `natbib.sty` can be found at <http://ctan.org/tex-archive/macros/latex/contrib/natbib/>

## ACKNOWLEDGEMENTS

Acknowledgements and other unnumbered sections are created using the `\section*` command:

```
\section*{Acknowledgment}
```

## BACK MATTER

Please use the respective coding for back matter sections.

```
%% For acknowledgment
```

```
\ack{Insert the Acknowledgment text here.}
```

```
%% For Competing interests
```

```
\competing{Insert the Competing interests text here.}
```

```
%% For contribution
```

```
\contribution{Insert the Contribution text here.}
```

```
%% For funding
```

```
\funding{Insert the Funding interests text here.}
```

```
%% For data availability
```

```
\data{Insert the Data availability text here.}
```

```
%% For supplementary
```

```
\supplementary{Insert the supplementary text text here.}
```

## REFERENCES

The reference entries can be L<sup>A</sup>T<sub>E</sub>X typed bibliographies or generated through a B<sup>I</sup>B<sup>T</sup>E<sub>X</sub> database. B<sup>I</sup>B<sup>T</sup>E<sub>X</sub> is an adjunct to L<sup>A</sup>T<sub>E</sub>X that aids in the preparation of bibliographies. B<sup>I</sup>B<sup>T</sup>E<sub>X</sub> allows authors to build up a database or collection of bibliography entries that may be used for many manuscripts. They also save us the trouble of having to specify formatting. More details can be found in the *B<sup>I</sup>B<sup>T</sup>E<sub>X</sub> Guide*. For L<sup>A</sup>T<sub>E</sub>X reference entries use the `\begin{thebibliography}... \end{thebibliography}` environment (see below) to make references in your paper. By default the class file will produce the unnumbered L<sup>A</sup>T<sub>E</sub>X bibliography.

```
\begin{thebibliography}
```

```
\bibitem[Arendt et al.(2016)]{bib1}
```

```
\textbf{Arendt, D., Musser, J. M., Baker, C. V., Bergman, A., Cepko, C., Erwin, D. H.,  
Pavlicev, M., Schlosser, G., Widder, S., Laubichler, M. D. et al.} (2016). The  
origin and evolution of cell types. \textit{Nat. Rev. Genet}. 17, 744--757.
```

```
\bibitem[Ben-Tabou et al.(2010)]{bib2}
```

```
\textbf{Ben-Tabou de-Leon, S. B. and Davidson, E. H.} (2010). Information processing at  
the foxa node of the sea urchin endomesoderm specification network. \textit{Proc. Natl  
Acad. Sci}. USA 107, 10103--10108.
```

```
\bibitem[Calestani and Rogers (2010)]{bib3}
```

`\textbf{Calestani, C. and Rogers, D. J.} (2010). Cis-regulatory analysis of the sea urchin pigment cell gene polyketide synthase. \textit{Dev. Biol.} 340, 249--255.`

`\bibitem[Cameron and Davidson (1991)]{bib4}`  
`\textbf{Cameron, R. A. and Davidson, E. H.} (1991). Cell type specification during sea urchin development. \textit{Trends Genet.} 7, 212--218.`

`\bibitem[Cameron et al.(1987)]{bib5}`  
`\textbf{Cameron, R. A., Hough-Evans, B. R., Britten, R. J. and Davidson, E. H.} (1987). Lineage and fate of each blastomere of the eight-cell sea urchin embryo. \textit{Genes Dev.} 1, 75--85.`

`\bibitem[Croce and McClay (2010)]{bib6}`  
`\textbf{Croce, J. C. and McClay, D. R.} (2010). Dynamics of Delta/Notch signaling on endomesoderm segregation in the sea urchin embryo. \textit{Development} 137, 83--91.`

`\end{thebibliography}`

## FORMATTING

Please use  $\LaTeX$  macros rather than the lower-level  $\TeX$  macros such as `\it`, `\bf` and `\tt`. The  $\LaTeX$  macros offer much improved features. The following table summarizes the font selection commands in  $\LaTeX$ .

### $\LaTeX$ text formatting commands

<code>\textit</code>	Italics	<code>\textsf</code>	Sans Serif
<code>\textbf</code>	Boldface	<code>\textsc</code>	Small Caps
<code>\texttt</code>	Typewriter	<code>\textmd</code>	Medium Series
<code>\textrm</code>	Roman	<code>\textnormal</code>	Normal Series
<code>\textsl</code>	Slanted	<code>\textup</code>	Upright Series

### $\LaTeX$ math formatting commands

<code>\mathit</code>	Math Italics	<code>\mathfrak</code>	Fraktur
<code>\mathbf</code>	Math Boldface	<code>\mathbb</code>	Blackboard Bold
<code>\mathtt</code>	Math Typewriter	<code>\mathnormal</code>	Math Normal
<code>\mathsf</code>	Math Sans Serif	<code>\boldsymbol</code>	Bold math for Greek letters
<code>\mathcal</code>	Calligraphic		and other symbols

## MACRO PACKAGES

The commonly used packages which can be used frequently are:

<code>amsmath</code>	<code>graphicx</code>	<code>rotating</code>
<code>amssymb</code>	<code>endnotes</code>	<code>subfigure</code>
<code>amsfonts</code>	<code>setspace</code>	<code>array</code>
<code>xspace</code>	<code>latexsym</code>	<code>url</code>
<code>amscd</code>	<code>multicol</code>	<code>algorithm</code>

If you wish to use other packages, these should be loaded using the `\usepackage` command in the preamble.

## APPENDIX

The `\appendix` command signals that all subsequent sections are appendices, and therefore the headings after `\appendix` will be set as appendix headings.

Note: All the figures, tables, equations, enunciations will be automatically numbered as A.1, A.2, etc. in the appendix.