



Instructions for the use of the `higherStructures` class

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Abstract

This document provides the instructions for the use of `higherStructures.cls`, the Higher Structures class file. The \TeX file which generates this document, `hsClassInst.tex`, demonstrates by example how this class file is to be used. For the final version of accepted articles to this journal, the use of this class file is mandatory. To generate the title and banner, use the `\maketitle` command after `\begin{document}` and before the abstract.

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MSC: 00A99; 18A05; 18D20; 18D50; 55P48.

Keywords: \LaTeX , Higher Structures, author instructions.

1. Class file inclusion and packages

The first line of code of the \TeX file should be one of the following:

```
\documentclass{higherStructures}
```

```
\documentclass[twoLevelNum]{higherStructures}
```

The latter form invokes the option `twoLevelNum`. This enables theorem numbering subordinate to subsections instead of sections, and ensures that the contents navigation sidebar (in any PDF viewer) is of the corresponding depth.

Various packages are already preloaded with the class file `higherStructures.cls`. In order that a consistency of style is maintained, and to avoid option clashes, authors should not reload the packages `geometry` and `hyperref`. The package `enumerate` should not be used. It conflicts with the preloaded package `enumitem`, which itself provides `enumerate`'s label-changing functions (and a lot more, see [1]).

For the full functioning of this class file, please ensure you are using the most recent \TeX version, which at this time is \TeX Live 2017.

2. Article data

The following data is mandatory:

Email address: higher.structures.ojs@gmail.com (Weber)

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- `\title`: article title, works as with other document classes, and accepts an optional argument usually intended for a shortened form of the title to be displayed on alternating headers.
- `\amsclass`: 2010 AMS classes associated with the article.
- `\keywords`: keywords associated with the article.

The data `\received`, `\accepted`, `\issue`, `\pubYear`, and `\startPage` are optional, and will be reset by the Managing Editor during the final processing stage.

3. Author data

An author is declared with the `\author` command, which accepts an optional argument for a shortened form of the author’s name for use in headers and footers. Beneath any `\author` command the address/affiliation and email address for that author are entered by the `\address` and `\email` commands respectively. At least one author, address and email address is mandatory. It is preferred that addresses and email addresses are entered for all authors, but this is not mandatory (for instance, one could just specify the email address of the corresponding author).

4. Long titles, author names and affiliations

Authors are invited to manually insert line breaks into titles, author names or addresses, where necessary. One case where this is useful is for avoiding unfortunate line breaks in the middle of an author’s name. For article titles and author names, you **must** then enter a shortened name without any line breaks, to prevent the line breaking from appearing in any headers and footers.

For example, if in addition to myself, Godfrey Harold Hardy and Srinivasa Iyengar Ramanujan are listed as authors of these notes, then you can force the third author’s entire name to be on the second line by inserting a line break at the beginning of the third name as follows:

```
\author[Weber]{Mark Weber}
...
\author[Hardy]{Godfrey Harold Hardy}
\author[Ramanujan]{\ Srinivasa Iyengar Ramanujan}
```

5. Abstract

All articles must come with an abstract provided within the

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

environment. This must be placed after the `\maketitle` command, and before the beginning of the first section of the article.

6. Theorems, definitions, propositions and so on

We use the `amsthm` package to govern the typesetting of the various theorem environments.

Remark 6.1. This should be familiar to most authors.

The complete documentation of the `amsthm` package is given in [5].

Proposition 6.2. *Only the `theorem` environment has been predefined, so that numbering works correctly, and the other environments are left to the author to define.*

Proof. See the $\text{T}_{\text{E}}\text{X}$ file for these notes, and Section 5 of the class file `higherStructures.cls`. \square

There are three types of environments: `plain`, `definition` and `remark`. Remark 6.1, Proposition 6.2, and the claim below are instances of environments defined with the declarations

```
\newtheorem{prop}[theorem]{Proposition}
\theoremstyle{definition}
\newtheorem{rem}[theorem]{Remark}
\theoremstyle{remark}
\newtheorem*{claim}{Claim}
```

in which the option `[theorem]` of the first two declarations, ensures that the new numbered theorem environments use the `theorem` counter.

Claim. Unnumbered theorem environments are defined using `\newtheorem*`. These can be of any type.

7. Bibliography and the contents pane

It is anticipated that most authors use $\text{BIB}_{\text{T}_{\text{E}}\text{X}}$, and this journal uses the plain bibliography style. The bibliography below was generated by

```
\bibliographystyle{plain}
\bibliography{ForHSCClass.bib}
```

where `ForHSCClass.bib` is the `.bib` file used for these notes. For the convenience of the Managing Editor, it would be better if for any submission, everything is included in the one $\text{T}_{\text{E}}\text{X}$ file. So when using $\text{BIB}_{\text{T}_{\text{E}}\text{X}}$, just copy the contents of the generated `.bbl` file, and remove or comment out the `\bibliographystyle` and `\bibliography` commands. This is demonstrated in the $\text{T}_{\text{E}}\text{X}$ file for these notes.

A command `\arxiv` has been added to get clickable arXiv numbers in the bibliographies. For the example [4] this was achieved with `\arxiv{1612.04888}`.

We will not include a table of contents in the articles themselves. However, a table of contents is generated which will display in the navigation/bookmarks bar of any PDF viewer. Numbered sections automatically appear. To add an extra bookmark, say for any unnumbered section, or indeed at any location in your article use the command

```
\addcontentsline{toc}{section or subsection}{<NameToAppear>}
```

at the location of the desired bookmark. For these notes, we have done this to ensure that the acknowledgements and bibliography show up in the bookmarks.

8. Understanding the class file

For those wishing to understand how the class file works¹, `higherStructures.cls` includes fairly extensive comments. Attempts have also been made to organise it in a comprehensible way. Most of the code is at a fairly high level, just using the many packages that exist for various purposes (like customising section headings). Lower level $\text{L}_{\text{A}}\text{T}_{\text{E}}\text{X}$ code was used in sections 3 and 4, which controls how author and article data is processed. See [2, 3] for background $\text{T}_{\text{E}}\text{X}$ nical information.

¹This is absolutely not necessary for those just wishing to use it.

Appendix A: Journal style for appendices

Appendices are sections which appear within the

```
\begin{appendices} ... \end{appendices}
```

environment, and should be placed at the end of the paper just before the acknowledgements.

Acknowledgements

Please write your acknowledgements in a separate unnumbered section like this, just before the bibliography.

References

- [1] Javier Bezos. Customizing lists with the `enumitem` package. Available from [here](#).
- [2] M. Goossens, F. Mittelbach, and A. Samarin. *The L^AT_EX Companion*. Addison-Wesley, 1994.
- [3] Donald E. Knuth. *The T_EXbook*. Addison-Wesley, 1984.
- [4] S.G. Kranz. A primer of mathematical writing, second edition. [arXiv:1612.04888](#).
- [5] PTGAMS. Using the `amsthm` package. Available from [here](#).