

The `uhassignment` document class

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Abstract

The `uhassignment` document class is a document class designed to be used for assignments in university (or school). The class predominantly implements a custom layout for titles but also features some helpful new commands. The class was originally designed to be used at the university of Hamburg.

Change History

v1.0

General: Initial version **1**

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1 Usage

1.1 Class Options

Currently the `uhassignment` class supports three (or rather six) options:

By default the `uhassignment` class expects the assignment sheets to be numbered and issues a warning if the `\sheetno` is missing. However if you do not want to specify a sheet number you can use the `unnumberedsheets` class option to suppress the warning. The package option also removes any text indicating the sheet number from the output.

The opposite option `numberedsheets` is used by default.

You can specify the `repeatauthor` class option to display a short version of the `\author` on each page in the footer (including the first page). The short version of the author is specified with the `\author` command as an optional first parameter. By default the normal `\author` is used as short author as well. By default the short author will not be displayed at all.

You can pass `shorttitle` class option to display the short university name and short course name in the title. You could also explicitly pass `longtitle` which is the default.

Similarly you can pass `shortheader` or `longheader` to display the short or regular university and course name in the header on each subsequent page.

1.2 The Title

The main feature of the `uhassignment` class is the custom title layout. The layout implements some new fields like the name of the university (or school), the name of the teacher or the number of the exercise sheet. The full list of supported fields is listed below. The actual title layout may be different depending on which of the following fields are actually specified.

<code>\university</code>	<code>\university[<i><short uni></i>]{<i><uni></i>}</code>	Lets you specify the name of the university (or school). The default value is <code>Universität Hamburg</code> .
<code>\course</code>	<code>\course[<i><short course></i>]{<i><course></i>}</code>	Lets you specify the name of the course of the assignment. The course is sometimes referred to as a <i>module</i> .
<code>\teacher</code>	<code>\teacher{<i><teacher></i>}</code>	Lets you specify the name of the teacher or teachers of the course. If you want to specify multiple teachers it is recommended that you separate them with the <code>\\</code> command.
<code>\group</code>	<code>\group{<i><group number></i>}</code>	The exercises for many university courses are divided into multiple exercise groups. Using this command you can specify the number of your group.
<code>\sheetno</code>	<code>\sheetno{<i><sheet number></i>}</code>	Lets you specify the current exercise sheet. If no <code>\title</code> is provided the sheet number is used as title of the document.

In addition to the above new commands you can also specify a `\title`, `\date` and one or more `\authors`.

`\id` Sometimes you have to provide your student ID with your solutions to an exercise sheet. The `uhassignment` class provides the `\id{<id>}` command for this case. This command should be used when specifying the authors with the `\author` command. It might look like this: `\author{John Doe\id{1234567}}`

1.3 Tasks and Subtasks

The `uhassignment` class is based on `scartcl` from the KOMA packages so its main sectioning level are sections (not chapters). Sections and subsections however do not always accurately reflect the semantics of solutions to an assignment. Instead the `uhassignment` class provides the following commands:

`\task` `\task[<task number>]{<task name>}`

The `\task` command replaces the `\section` command. It incrementally numbers the tasks (starting at 1). If you want to skip a task you can use the optional `<task number>` argument to set the task number to a specific value. Subsequent tasks are then incrementally numbered.

`\subtask` `\subtask[<task number>]{<task name>}`

`\subsubtask` `\subsubtask[<task number>]{<task name>}`

The `\subtask` and `\subsubtask` replace `\subsection` and `\subsubsection` respectively. They work analogous to `\task`.

The standard sectioning commands are not modified by the `uhassignment` class so it is still possible to use them. In fact the `\task` commands do create sections and subsections internally. You should however be careful in using `\sections` yourself because it may be difficult to distinguish `\tasks` from `\sections`.

1.4 Todos

The `uhassignment` class offers rudimentary support for todo notes. Currently todo support is very limited and may not work in some cases.

`\todo` `\todo[<todo text>]`

The `\todo` command does two things:

1. It puts a todo marker in the text where the `\todo` command is specified.
`\todomark` The todo marker is defined by the `\todomark` command.
2. It puts a todo note at the page margin so that you can easily spot open todos in the PDF. The text of the todo note can be customized using the `<todo text>` optional argument.

2 Implementation

In addition to the options provided by `scartcl` the `uhassignment` class supports the following options.

```

1 \newif\ifuhassignment@numberedsheets
2 \DeclareOption{unnumberedsheets}{
3   \uhassignment@numberedsheetsfalse
4 }
5
6 \DeclareOption{numberedsheets}{
7   \uhassignment@numberedsheetstrue
8 }
9
10 \newif\ifuhassignment@repeatauthor
11 \uhassignment@repeatauthorfalse
12 \DeclareOption{repeatauthor}{
13   \uhassignment@repeatauthortrue
14 }
15
16 \newif\ifuhassignment@shorttitle
17 \DeclareOption{shorttitle}{
18   \uhassignment@shorttitletrue
19 }
20
21 \DeclareOption{longtitle}{
22   \uhassignment@shorttitlefalse
23 }
24
25 \newif\ifuhassignment@shorthead
26 \DeclareOption{shorthead}{
27   \uhassignment@shortheadtrue
28 }
29
30 \DeclareOption{longheader}{
31   \uhassignment@shortheadfalse
32 }
33
34 \ExecuteOptions{longtitle,longheader,numberedsheets}
35
36 \ProcessOptions\relax
   The uhassignment class is based on scrartcl.
37 \LoadClassWithOptions{scrartcl}

```

2.1 Dependencies

```

38 \RequirePackage[utf8]{inputenc} % UTF-8 Encoding
39 \RequirePackage{cmap} % Special Characters
40 \RequirePackage[T1]{fontenc} % Font Encoding
41 \RequirePackage[ngerman]{babel} % German Language
42 \RequirePackage{etoolbox} % Programming
43 \RequirePackage{calc} % Calculations
44
45 \RequirePackage[a4paper,

```

```

46         left=25mm,
47         right=25mm,
48         top=20mm,
49         bottom=50mm]{geometry} % Page Margins
50
51 \RequirePackage[headsepline]{scrlayer-scrpage} % Header and Footer
52 \RequirePackage{lastpage} % Page Numbers
53
54 \RequirePackage{amsmath} % Maths
55 \RequirePackage{amssymb} % Maths
56 \RequirePackage{amsthm} % Beweise
57 \RequirePackage{enumitem} % Customizable Enumerations
58
59 \RequirePackage{xcolor} % Colors
60 \RequirePackage{framed} % Colored Boxes
61 \RequirePackage[colorlinks,linkcolor=black]{hyperref} % References
62 \RequirePackage{lmodern} % Better Font

```

2.2 Constants

The following constants are used throughout the template. They can be overridden for customizations.

```

63 \def\uhassignment@sheetid{Aufgabenblatt}
64 \def\uhassignment@groupid{Übungsgruppe}

```

2.3 Definitions

2.3.1 Title Elements

`\university` The `\university` command stores the name of the university for later use.

```

65 \newcommand{\university}[2] []{
66     \ifstrempy{#1}{
67         \gdef\@shortuniversity{#2}
68     }{
69         \gdef\@shortuniversity{#1}
70     }
71     \gdef\@university{#2}
72 }

```

`\course` The `\course` command stores the name of the course for later use.

```

73 \newcommand{\course}[2] []{
74     \ifstrempy{#1}{
75         \gdef\@shortcourse{#2}
76     }{
77         \gdef\@shortcourse{#1}
78     }
79     \gdef\@course{#2}
80 }

```

`\teacher` The `\teacher` command stores the name of the teacher for later use.

```

81 \newcommand{\teacher}[1]{
82   \gdef\@teacher{#1}
83 }

\group The \group command stores the name of the group for later use.
84 \newcommand{\group}[1]{
85   \gdef\@group{#1}
86 }

\sheetno The \sheetno command stores the assignment sheet number for later use.
87 \newcommand{\sheetno}[1]{
88   \gdef\@sheetno{#1}
89 }

\id The \id macro prints the id of an author. The default implementation puts the
id on a new line in parentheses.
90 \newcommand{\id}[1]{\ttfamily\footnotesize(#1)}

\author The \author command is overridden by this class to support a short author that
may be printed at the bottom of each page.
91 \renewcommand{\author}[2][]{
92   \ifstrempy{#1}{
93     \gdef\@shortauthor{#2}
94   }{
95     \gdef\@shortauthor{#1}
96   }
97   \gdef\@author{#2}
98 }

The default values for most fields are empty. The default university is the
university of Hamburg.
99 \university[Uni Hamburg]{Universität Hamburg}
100 \def\@course{
101   \ClassWarning{uhassignment}{No \protect\course\space given}
102 }
103 \let\@shortcourse\@course
104 \group{}
105 \def\@teacher{
106   \ClassWarning{uhassignment}{No \protect\teacher\space given}
107 }
108 \let\@shortteacher\@teacher
109 \def\@sheetno{
110   \ClassWarning{uhassignment}{No \protect\sheetno\space given}
111 }
112 \def\@shortauthor{
113   \ClassWarning{uhassignment}{No short \protect\author\space given}
114 }
115 \title{}
116

```

2.3.2 Todos

`\todomark` The `\todomark` is placed in the text when the `\todo` command is used. The default implementation draws a purple box with the text "Todo" inside.

```
117 \newcommand{\todomark}{%
118   \colorbox{purple}{%
119     \textnormal\ttfamily\bfseries\color{white}%
120     TODO%
121   }%
122 }
```

`\todo` The `\todo` macro places the `\todomark` and puts a todo text in a marginpar.

```
123 \newcommand{\todo}[1] []{%
124   \ifstrempy{#1}{%
125     \def\todotext{Todo}%
126   }{%
127     \def\todotext{Todo: #1}%
128   }%
129   \todomark%
130   {%
131     \marginpar{%
132       \raggedright\normalfont\sffamily\scriptsize\todotext%
133     }%
134   }%
135 }
```

2.3.3 Tasks

The task mechanism of the `uhhassignment` class implements its own numbering mechanism. This is necessary because the task numbers do not necessarily correlate with section numbers.

```
136 \setcounter{secnumdepth}{0}
```

`\task` The `\task` command is basically just a wrapper around a section with a semi-customizable section title.

```
137 \newcounter{task}
138 \newcommand{\task}[2] []{%
139   \ifstrempy{#1}{%
140     \stepcounter{task}%
141   }{%
142     \setcounter{task}{#1}%
143   }%
144   \ifstrempy{#2}{%
145     \section{Aufgabe \arabic{task}}%
146   }{%
147     \section{Aufgabe \arabic{task}: #2}%
148   }%
149 }
```

`\subtask` The equivalent of `\subsection` for the `uhassignment` class. `\subtask` essentially wraps `\subsection` with a semi-customizable title.

```

150 \newcounter{subtask}[task]
151 \newcommand{\subtask}[2][ ]{%
152   \ifstrempy{#1}{%
153     \stepcounter{subtask}%
154   }{%
155     \setcounter{subtask}{#1}%
156   }%
157   \ifstrempy{#2}{%
158     \subsection{Teilaufgabe \arabic{task}.\arabic{subtask}}%
159   }{%
160     \subsection{\arabic{task}.\arabic{subtask}. #2}%
161   }%
162 }

```

`\subsubtask` The equivalent of `\subsubsection` for the `uhassignment` class. `\subsubtask` essentially wraps `\subsection` with a semi-customizable title. It probably is not necessary to use this very often.

```

163 \newcounter{subsubtask}[subtask]
164 \newcommand{\subsubtask}[2][ ]{%
165   \ifstrempy{#1}{%
166     \stepcounter{subsubtask}%
167   }{%
168     \setcounter{subsubtask}{#1}%
169   }%
170   \ifstrempy{#2}{%
171     \subsection{\arabic{task}.\arabic{subtask}.\arabic{subsubtask}}
172   }{%
173     \subsubsection{\arabic{task}.\arabic{subtask}.\arabic{subsubtask}. #2}%
174   }%
175 }

```

2.4 Page Setup

The `uhassignment` class defines its own header and footer using `scrpage`. The default setup shows the course, sheet number, university and date on every page.

```

176 \setlength{\headheight}{50pt}
177 \pagestyle{scrheadings}
178 \clearpaifpagestyles
179
180 % Header
181 \ifuhassignment@shorthead
182   \ifuhassignment@numberedsheets
183     \ihead{\textbf{@shortcourse}\\\uhassignment@sheetid} \@sheetno}
184   \else
185     \ihead{\textbf{@shortcourse}}

```



```

186   \fi
187   \ohead{\textbf{\@shortuniversity}\@\@date}
188 \else
189   \ifuhassignment@numberedsheets
190     \ihead{\textbf{\@course}\@uhassignment@sheetid} \@sheetno}
191   \else
192     \ihead{\textbf{\@course}}
193   \fi
194   \ohead{\textbf{\@university}\@\@date}
195 \fi
196
197 % Footer
198 \setkomafont{pagefoot}{\textnormal}
199 \ifuhassignment@repeatauthor
200   \ifoot[\@shortauthor]{\shortauthor}
201   \ofoot[Seite \pagemark{} von \pageref{LastPage}]{Seite \pagemark{} von \pageref{LastPage}}
202 \else
203   \cfoot[Seite \pagemark{} von \pageref{LastPage}]{Seite \pagemark{} von \pageref{LastPage}}
204 \fi
205
206 \newpagestyle{firstpage}[]{\%
207   \ihead{}
208   \cfoot{\pagemark{}}
209 }

```

2.5 Layout

The `uhassignment` class overrides some font settings and adjusts the paragraph spacing to create a more distinct layout.

```

210 \setlength{\parskip}{5pt}
211
212 \setkomafont{section}{\normalfont\bfseries\LARGE}
213 \setkomafont{subsection}{\normalfont\bfseries\Large}
214 \setkomafont{subsubsection}{\normalfont\bfseries\large}
215 \RedeclareSectionCommands[afterskip=.25\baselineskip]{section}
216 \RedeclareSectionCommands[
217   beforeskip=0.5\baselineskip,
218   afterskip=.125\baselineskip]{subsection}

```

`\maketitle` The `uhassignment` class completely redefines the `\maketitle` macro. This implementation actually defines the layout of the final title depending on which information was specified by the user (group number, a title, ...).

We differentiate two *states* of the title. If the user does not specify a title and does not specify a group the title will be rearranged to not display too much empty space. This is implemented via the `\ifextended` definition.

```

219 \renewcommand*{\maketitle}{\%
220   \thispagestyle{plain}\%
221

```

```

222 \newif\ifextended
223 \extendedtrue
224
225 \ifuhassignment@shorttitle
226     \let\university\@shortuniversity
227     \let\course\@shortcourse
228 \else
229     \let\university\@university
230     \let\course\@course
231 \fi

```

First we define the different layout parts. The title has six *slots* each of which can hold a piece of text:

Top Left On the top left the course name is printed in a bold font.

Top Right On the top right the name of the university is printed in a bold font.

Meta Left Below the course name a piece of information is printed. The contents of this slot depend on the specified information and can be either the group number or the teacher.

Meta Right Similar to meta left but below the university name. This slot typically holds the teacher or the date.

Title Left Above the actual title there is a row of secondary titles. On the left of this row the sheet number is printed.

Title Right Similarly to title left this slot may contain the date.

Below the header the actual document title and the author(s) are printed. If no `\title` is specified the sheet number becomes the title (`\title` however remains empty).

```

232 \ifdefempty{\@title}{%
233     \ifdefempty{\@group}{%
234         \def\metaleft{\@teacher}%
235         \def\metaright{\@date}%
236         \def\titleright{}%
237         \extendedfalse
238     }%
239     \def\metaleft{\uhassignment@sheetid{} \@group}%
240     \def\metaright{\@teacher}%
241     \def\titleright{\@date}%
242 }%
243 \def\titleleft{}%
244 \ifuhassignment@numberedsheets
245     \def\title{\uhassignment@sheetid{} \@sheetno}%
246 \else
247     % Title remains user-specified
248 \fi
249 }%

```

```

250     \ifdefempty{\@group}{%
251         \def\metaleft{}%
252         \def\metaright{\@teacher}%
253     }{%
254         \def\metaleft{\uhassignment@groupid{} \@group}%
255         \def\metaright{\@teacher}%
256     }%
257     \ifuhassignment@numberedsheets
258         \def\titleleft{\uhassignment@sheetid{} \@sheetno}%
259     \else
260         \def\titleleft{}
261     \fi
262     \def\titleright{\@date}%
263     \def\title{\@title}%
264 }%

```

The following code prints the title with the information specified above. Depending on the value of `\ifextended` the title will be longer or shorter.

Each field (heading, secondary title, title, author) is put in a separate group to avoid interference.

```

265     \begingroup% Heading Group
266         \usekomafont{pageheadfoot}%
267         \usekomafont{pagehead}%
268         \setlength{\parskip}{0pt}%
269
270
271         \textbf{\course} \hfill \textbf{\university}\par%
272
273         \begin{minipage}[t]{\widthof{\metaleft}}%
274             \metaleft%
275         \end{minipage}%
276         \hfill%
277         \begin{minipage}[t]{\widthof{\metaright}}%
278             \raggedleft%
279             \metaright%
280         \end{minipage}%
281     \endgroup%
282
283     \ifextended%
284         \vspace{\baselineskip}%
285     \fi%
286
287     \begingroup% Secondary Title Group
288         \Large\bfseries\titleleft\hfill\titleright%
289     \endgroup%
290
291     \begingroup% Title Group
292         \begin{center}%
293             \Huge\textsc{\title}%
294         \end{center}%

```

```

295 \endgroup%
296
297 \begingroup% Author Group
298 \setlength{\baselineskip}{2.75\baselineskip}%
299 \vspace{-\baselineskip}%
300 \begin{center}%
301 \begin{tabular}[t]{c}%
302 \@author%
303 \end{tabular}%
304 \end{center}%
305 \endgroup%
306 }

```

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