LaTeX-cursus Week 1

TeXniCie

26/28 september 2023

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Agenda

Week 1 (26/28 september)

- Introductie tot LaTeX en Overleaf
- LaTeX documentstructuur
- Tekst
- Wiskunde

Week 2 (3/5 oktober)

- Referenties
- Afbeeldingen
- Extra wiskunde

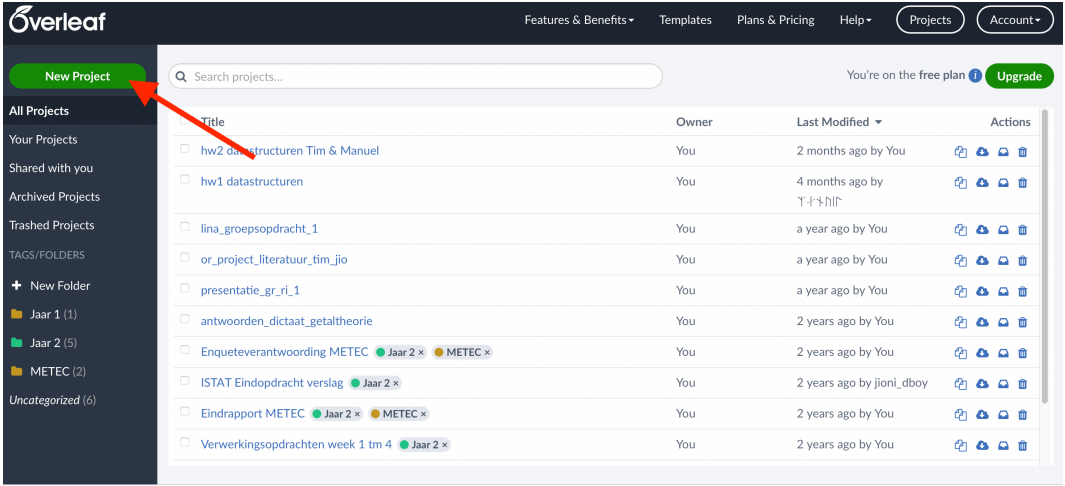
Week 3 (10/12 oktober)

- Tabellen
- \newcommand
- \DeclareMathOperator
- Bibliografie
- Commutatieve diagrammen

Week 4 (17 oktober)

- Installatie VS Code
- Vragenuurtje

Overleaf


Overleaf
Features & Benefits
Templates
Plans & Pricing
Help
Projects
Account
New Project
Search projects...
You're on the free plan
Upgrade
All Projects
Your Projects
Shared with you
Archived Projects
Trashed Projects
TAGS/FOLDERS
New Folder
Jaar 1 (1)
Jaar 2 (5)
METEC (2)
Uncategorized (6)
Title
Owner
Last Modified
Actions
hw2 datastructuren Tim & Manuel
You
2 months ago by You
hw1 datastructuren
You
4 months ago by
lina_groepsopdracht_1
You
a year ago by You
or_project_literatuur_tim_jio
You
a year ago by You
presentatie_gr_ri_1
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antwoorden_dictaat_getaltheorie
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Jaar 2
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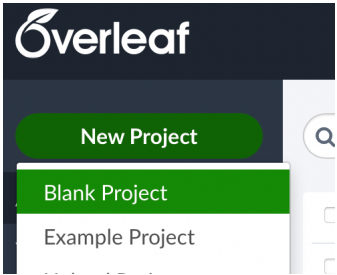
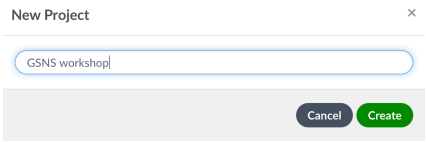
Overleaf


Overleaf
New Project
Blank Project
Example Project


New Project
GSNS workshop
Cancel
Create

Een eenvoudig document in LaTeX

```
1  \documentclass{article}
2
3
4  \begin{document}
5
6
7
8
9
10
11
12
13 \end{document}
```

preamble: document settings go here

body: content (text and images) goes here

Een eenvoudig document in LaTeX

```
1  \documentclass{article}
2
3
4  \begin{document}
5
6  The Differential and Integral
7  Calculus, or, as it was formerly
8  called in this country,
9  the Doctrine of Fluxions, has always
10 been supposed to present remarkable
11 obstacles to the beginner.
12
13 \end{document}
```

Example text: "Elementary Illustrations of the Differential and Integral Calculus" by Augustus De Morgan

body: inhoud (tekst, plaatjes, tabellen) hier

Een eenvoudig document in LaTeX

```
1  \documentclass[a4paper,11pt]{article}
2
3
4  \begin{document}
5
6  The Differential and Integral
7  Calculus, or, as it was formerly
8  called in this country,
9  the Doctrine of Fluxions, has always
10 been supposed to present remarkable
11 obstacles to the beginner.
12
13 \end{document}
```

preamble: instellingen hier

Example text: "Elementary Illustrations of the Differential and Integral Calculus" by Augustus De Morgan

```
\documentclass{article}
\usepackage{graphicx}

\title{Example project}
\author{Vincent Kuhlmann}
\date{September 2023}

\begin{document}

\maketitle

\section{Introduction}

\end{document}
```

Document structure:

- Preamble.
  This is where configuration goes.
  - `\documentclass`: specify a template.
  - `\usepackage{xxx}`: import package 'xxx'.
  - Other: a.o. setting the title of your document
- Document body.
  This is where the text and other content go.

LaTeX commands

LaTeX commando's beginnen met een backslash \, gevolgd door letters of een speciaal teken: , #, %, ...
Commando's kunnen **argumenten** en **optionele argumenten** hebben.

```
\commando
```

of

```
\commando{argument}
```

of

```
\commando[optioneel argument]{argument}
```

LaTeX commands

Sommige commando's staan in de **body** van het document

Het commando `\LaTeX` print het LaTeX logo. Dit commando staat in de **body** van het document.

`\newpage` begint een nieuwe pagina en staat ook in de **body** van het document.

`\textbf{text}` is een commando voor **vetgedrukte** tekst. Dit commando heeft 1 argument.

`\sqrt[3]{y}` $\sqrt[3]{y}$ het wortelargument heeft 1 argument en 1 optioneel argument.

LaTeX commands

Andere commando's staan in de **preamble** van het document

Met `\title` geef je het document een titel.

`\usepackage{...}` laadt LaTeX code van anderen in je document. Deze code definiëert vaak nieuwe commando's of past bestaande commando's aan. Soms verandert de opmaak van je pagina ook door het laden van een package.

`\usepackage[paper=a5paper, margin=2cm, landscape=true]{geometry}` laadt het geometry package met 3 optionele argumenten.

Oefeningen

Whitespace

- a␣␣␣␣␣b → a b

Whitespace

- a␣␣␣␣b
- a\␣\␣\␣\␣b

a b

a b

Whitespace

- a␣␣␣␣␣b → a b
- a\␣\␣\␣\␣\␣b → a b
- a\quad␣b → a b

Whitespace

- `a␣␣␣␣b` a b
- `a\␣\␣\␣\␣b` a b
- `a\quad␣b` a b
- `a\hspace{2cm}b` a b

Whitespace

- `a␣␣␣␣b` → a b
- `a\␣\␣\␣\␣b` → a b
- `a\quad␣b` → a b
- `a\hspace{2cm}b` → a b
- `\LaTeX␣is␣cool!` → LaTeXis cool!

Whitespace

- `a␣␣␣␣b` → a b
- `a\␣\␣\␣\␣b` → a b
- `a\quad␣b` → a b
- `a\hspace{2cm}b` → a b
- `\LaTeX␣is␣cool!` → LaTeXis cool!
- `\LaTeX{}␣is␣cool!` → LaTeX is cool!

Paragraphs

Een paragraaf bestaat uit enkele regels tekst. Paragrafen worden van elkaar gescheiden door **witregels**.

```
\documentclass[a4paper, 10pt]{article}
\begin{document}
The agitation for the Universal Colour Bill
continued for three years; and up to the
last moment of that period it seemed as
though Anarchy were destined to triumph.

A whole army of Polygons, who turned out
to fight as private soldiers, was utterly
annihilated by a superior force of Isosceles
Triangles --- the Squares and Pentagons
meanwhile remaining neutral.
\end{document}
```

The agitation for the Universal Colour Bill continued for three years; and up to the last moment of that period it seemed as though Anarchy were destined to triumph.

A whole army of Polygons, who turned out to fight as private soldiers, was utterly annihilated by a superior force of Isosceles Triangles — the Squares and

Paragraphs

Standaard worden paragrafen ingesprongen. De paragrafen scheiden met een witregel in plaats van inspringing kan door het commando `\usepackage{parskip}` aan de preamble toe te voegen.

```
\documentclass[a4paper, 10pt]{article}
\usepackage{parskip}
\begin{document}
The agitation for the Universal Colour Bill
continued for three years; and up to the
last moment of that period it seemed as
though Anarchy were destined to triumph.

A whole army of Polygons, who turned out
to fight as private soldiers, was utterly
annihilated by a superior force of Isosceles
Triangles --- the Squares and Pentagons
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```

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A whole army of Polygons, who turned out to fight as private soldiers, was utterly annihilated by a superior force of

Sections

Het commando `\section{SECTIONNAME}` maakt een heading (titel, kop, tussenkopje). Deze headings worden automatisch genummerd. Andere headings zijn:

- `\subsection{}` , `\subsubsection{}` and `\paragraph{}`

```
\documentclass[a4paper]{article}
\begin{document}
\section{How I tried to teach the Theory of Three Dimensions to my
Grandson, and with what success}
I awoke rejoicing, and began to reflect on the glorious career before me.
I would go forth, methought, at once, and evangelize the whole of Flatland.
Even to Women and Soldiers should the Gospel of Three Dimensions
be proclaimed. I would begin with my Wife.
\end{document}
```

Example text: “Flatland” by Edwin A. Abbott

Title, author and date

We geven het artikel nu een titel. We gebruiken drie commando's om een **title**, **author** en **date** in te stellen. Deze commando's staan in de **preamble**.

Het commando `\maketitle` staat in de **body** van het document en bepaalt de positie van de titel.

```
1  \documentclass[a4paper, 12pt]{article}
2  \title{Elementary Illustrations of the Differential and Integral Calculus}
3  \author{Augustus De Morgan}
4  \date{November 11}
5  \begin{document}
6  \maketitle
7  The Differential and Integral Calculus, or, as it was formerly
8  called in this country, the Doctrine of Fluxions, has always
9  been supposed to present remarkable obstacles to the beginner.
10 \end{document}
```

Speciale tekens

Code	Resultaat	Code	Resultaat
\{	{	{	Begin groep
\}	}	}	Eindig groep
\%	%	%	Comment
_	_	_	Betekenis voor wiskunde
\textasciicircum	^	^	Betekenis voor wiskunde
\$	$	$	Wiskundemodus
\textbackslash	\	\	Commando
\&	&	&	Kolomscheiding
\#	#	#	Parameter
\textgreater	>	>	>
\textless	<	<	<

Speciale tekens

Code	Resultaat	Code	Resultaat
\{	{	{	Begin groep
\}	}	}	Eindig groep
\%	%	%	Comment
_	_	_	Betekenis voor wiskunde
\textasciicircum	^	^	Betekenis voor wiskunde
\$	$	$	Wiskundemodus
\textbackslash	\	\	Commando
\&	&	&	Kolomscheiding
\#	#	#	Parameter
\textgreater	>	>	>
\textless	<	<	<

Formatting text

Resultaat, Code	Resultaat, Code
Text	`Text`
Text	Text
TEXT	Text
Text	Text

Formatting text

Resultaat,	Code	Resultaat,	Code
Text	`\textbf{Text}`	Text	
Text		Text	
TEXT		Text	
Text		Text	

bf = **b**old**f**ace | **it** = **it**alics | **sc** = **s**mall**c**aps | **tt** = **t**ele**t**ype (a.k.a. monospace)

Formatting text

Resultaat,	Code	Resultaat,	Code
Text	`\textbf{Text}`	Text	
Text	`\textit{Text}`	Text	
TEXT		Text	
Text		Text	

Formatting text

Resultaat,	Code	Resultaat,	Code
Text	`\textbf{Text}`	Text	
Text	`\textit{Text}`	Text	
TEXT	`\textsc{Text}`	Text	
Text		Text	

Formatting text

Resultaat,	Code	Resultaat,	Code
Text	`\textbf{Text}`	Text	
Text	`\textit{Text}`	Text	
TEXT	`\textsc{Text}`	Text	
Text	`\underline{Text}`	Text	

Formatting text

Resultaat,	Code	Resultaat,	Code
Text	`\textbf{Text}`	Text	`\texttt{Text}`
Text	`\textit{Text}`	Text	
TEXT	`\textsc{Text}`	Text	
Text	`\underline{Text}`	Text	

Formatting text

Resultaat,	Code	Resultaat,	Code
Text	`\textbf{Text}`	Text	`\texttt{Text}`
Text	`\textit{Text}`	Text	`{\tiny Text}`
TEXT	`\textsc{Text}`	Text	
Text	`\underline{Text}`	Text	

Formatting text

Resultaat,	Code	Resultaat,	Code
Text	`\textbf{Text}`	Text	`\texttt{Text}`
Text	`\textit{Text}`	Text	`{\tiny Text}`
TEXT	`\textsc{Text}`	Text	`{\LARGE Text}`
Text	`\underline{Text}`	Text	

Formatting text

Resultaat,	Code	Resultaat,	Code
Text	`\textbf{Text}`	Text	`\texttt{Text}`
Text	`\textit{Text}`	Text	`{\tiny Text}`
TEXT	`\textsc{Text}`	Text	`{\LARGE Text}`
Text	`\underline{Text}`	Text	

Huge, huge, LARGE, Large, large, normalsize, small, footnotesize, scriptsize, tiny

Formatting text

Resultaat,	Code	Resultaat,	Code
Text	`\textbf{Text}`	Text	`\texttt{Text}`
Text	`\textit{Text}`	Text	`{\tiny Text}`
TEXT	`\textsc{Text}`	Text	`{\LARGE Text}`
Text	`\underline{Text}`	Text	`\textcolor{red}{Text}` [1]

Huge, huge, LARGE, Large, large, normalsize, small, footnotesize, scriptsize, tiny

[1] `\usepackage{xcolor}`

Logische opmaak

Het is vaak beter om niet teveel van de vorige commando's gebruik te maken om de *logische opmaak* filosofie van LaTeXte volgen.

	niet logisch	logisch	resultaat
vector	`\stackrel{\rightarrow}{w}`	`\vec{w}`	$\vec{w}$
nadruk	`\textit{text}`	`\emph{text}`	*text*
kop	`\Large My Heading`	`\subsection{My Heading}`	My Heading
lemma	`\textsc{LEMMA 3.2}`	`\begin{mylemma}...\end{mylemma}`	LEMMA 3.2

Oefeningen

Wiskunde

Er zijn twee manieren om wiskunde te zetten:

inline mode

The trigonometric identity is given by $\sin^2(\theta) + \cos^2(\theta) = 1$ for all θ.

display mode

The Pythagorean trigonometric identity is given by

$$\sin^2(\theta) + \cos^2(\theta) = 1. \tag{1}$$

The identity

$$1 + tan^2(\theta) = \frac{1}{cos^2\theta} \tag{2}$$

is also called the Pythagorean trigonometric identity.

Inline wiskunde

Tekst en symbolen tussen `$` en `$` worden gezien als **wiskundige symbolen**.

```
\documentclass[a5paper]{article}
\begin{document}
The trigonometric identity is
given by $ \sin^2(\theta) + \cos^2(\theta) = 1 $. This identity is also
called the Pythagorean trigonometric identity.
\end{document}
```

The trigonometric identity is given by $\sin^2(\theta) + \cos^2(\theta) = 1$. This identity is also called the Pythagorean trigonometric identity.

Wiskundepackages

De onderstaande drie packages zijn handig om wiskunde te zetten:

```
\documentclass[a4paper, 10pt]{article}
\usepackage{amsmath}
\usepackage{amssymb}
\usepackage{amsthm}
\begin{document}
\begin{align*}
    ax^2 + bx + c = 0 \qquad
    \text{De algemene vorm van de kwadratische vergelijking}
\end{align*}
\end{document}
```

Met deze packages kun je tekst toevoegen aan formules, extra symbolen gebruiken zoals $\boxplus$, $\rightsquigarrow$ en $\mathbb{R}$ betere environments voor stellingen en bewijzen gebruiken.

Wiskunde - basis

Formule	Code	Formule	Code
$\sqrt{2}$	`$ $`	$\sqrt[3]{8}$	`$ $`
$\frac{2}{3}$	`$ $`	x_1	`$ $`
$6 \geq 3$	`$ $`	x_1^2	`$ $`
$a^2 + b^2$	`$ $`	a^{2+b^2}	`$ $`

Wiskunde - basis

Formule	Code	Formule	Code
$\sqrt{2}$	`$ \sqrt{2} $`	$\sqrt[3]{8}$	`$ $`
$\frac{2}{3}$	`$ $`	x_1	`$ $`
$6 \geq 3$	`$ $`	x_1^2	`$ $`
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$\sqrt{2}$	`$ \sqrt{2} $`	$\sqrt[3]{8}$	`$ $`
$\frac{2}{3}$	`$ \frac{2}{3} $`	x_1	`$ $`
$6 \geq 3$	`$ $`	x_1^2	`$ $`
$a^2 + b^2$	`$ $`	a^{2+b^2}	`$ $`

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Formule	Code	Formule	Code
$\sqrt{2}$	`$ \sqrt{2} $`	$\sqrt[3]{8}$	`$ \sqrt[3]{8} $`
$\frac{2}{3}$	`$ \frac{2}{3} $`	x_1	`$ x_1 $`
$6 \geq 3$	`$ 6\geq 3 $`	x_1^2	`$ x_1^2 $`
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$\frac{2}{3}$	`$ \frac{2}{3} $`	x_1	`$ x_1 $`
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$\sqrt{2}$	`$ \sqrt{2} $`	$\sqrt[3]{8}$	`$ \sqrt[3]{8} $`
$\frac{2}{3}$	`$ \frac{2}{3} $`	x_1	`$ x_1 $`
$6 \geq 3$	`$ 6\geq 3 $`	x_1^2	`$ x_1^2 $`
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Wiskunde - basis

Formule	Code	Formule	Code
$\sqrt{2}$	`$ \sqrt{2} $`	$\sqrt[3]{8}$	`$ \sqrt[3]{8} $`
$\frac{2}{3}$	`$ \frac{2}{3} $`	x_1	`$ x_1 $`
$6 \geq 3$	`$ 6\geq 3 $`	x_1^2	`$ x_1^2 $`
$a^2 + b^2$	`$ a^2 + b^2 $`	a^{2+b^2}	`$ a^{2 + b^2} $`

`$ x^22 $`: x^22

Wiskunde - basis

Formule	Code	Formule	Code
$\sqrt{2}$	`$ \sqrt{2} $`	$\sqrt[3]{8}$	`$ \sqrt[3]{8} $`
$\frac{2}{3}$	`$ \frac{2}{3} $`	x_1	`$ x_1 $`
$6 \geq 3$	`$ 6\geq 3 $`	x_1^2	`$ x_1^2 $`
$a^2 + b^2$	`$ a^2 + b^2 $`	a^{2+b^2}	`$ a^{2 + b^2} $`

`$ x^22 $`: x^22 | `$ x^{22} $`: x^{22}

Wiskunde - Bewijzen in de Wiskunde

Formule	Code	Formule	Code
$\sum_i x_i$	`$\sum_i x_i$`	$\bigcup_{i \in I} U_i$	`$\bigcup_{i \in I} U_i$`
$A \cup B$	`$A \cup B$`	$\emptyset$	`$\emptyset$`
$A \cap B$	`$A \cap B$`	$\forall$	`$\forall$`
$A \subseteq B$	`$A \subseteq B$`	$\exists$	`$\exists$`
$x \in A \implies x \in B$	`$x \in A \implies x \in B$`	$\neg$	`$\neg$`

Wiskunde - Bewijzen in de Wiskunde

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$A \cup B$	`$ A\cup B $`	$\emptyset$	`$ \emptyset $`
$A \cap B$	`$ A\cap B $`	$\forall$	`$ \forall $`
$A \subseteq B$	`$ A\subseteq B $`	$\exists$	`$ \exists $`
$x \in A \implies x \in B$	`$ x\in A\implies x\in B $`	$\neg$	`$ \neg $`

Wiskunde - Bewijzen in de Wiskunde

Formule	Code	Formule	Code
$\sum_i x_i$	`$ \sum_i x_i $`	$\bigcup_{i\in I} U_i$	`$ \bigcup_{i\in I}U_i $`
$A \cup B$	`$ A\cup B $`	$\emptyset$	`$ \emptyset $`
$A \cap B$	`$ A\cap B $`	$\forall$	`$ \forall $`
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Display mode

Er bestaan vele environmets voor wiskunde in Display mode. Vandaag bekijken we de **align** environment.

```
The double angle formula can now be rewritten as
\begin{align}
    \cos(2\theta) &=  \cos^2\theta - sin^2\theta \\
                  &= 2\cos^2\theta - 1
\end{align}
```

The double angle formula can now be rewritten as

$$\cos(2\theta) = \cos^2\theta - sin^2\theta \tag{3}$$
$$= 2\cos^2\theta - 1 \tag{4}$$

Eigen commando's

```
\newcommand{\Mod}[1]{\ (\mathrm{mod}\ #1)}
Because $ x $ is even we have
\begin{align*}
    x &= 0\ (\mathrm{mod}\ #1)\\
    x &= 0\Mod{2}
\end{align*}
```

Because x is even we have

$$x = 0 \ (\mathrm{mod}\ 2)$$
$$x = 0 \ (\mathrm{mod}\ 2)$$

Oefeningen

Afsluiting

De volgende cursusavond is dinsdag 3 oktober en donderdag.

Afsluiting

De volgende cursusavond is op dinsdag 3 oktober van 11:00 tot 12:45 en donderdag 5 oktober van 13:15 tot 15:00.
Locatie komt op de website te staan.

texnicie.nl

Loop je vast? Mail ons op
info@texnicie.nl

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