UNIVERSIDAD TÉCNICA PARTICULAR DE LOJA

La Universidad Católica de Loja

ÁREA TÉCNICA

TÍTULO DE MAESTRÍA EN CIENCIAS Y TECNOLOGÍAS DE LA COMPUTACIÓN

Desequilibrios de la Fuerza de Velocidad

TRABAJO DE TITULACIÓN.

AUTOR: Ramón, Francisco

DIRECTOR: West, Joe, Ing.

LOJA - ECUADOR

2019

APROBACIÓN DEL DIRECTOR DEL TRABAJO DE TITULACIÓN

Ingeniero.

Joe West.

DOCENTE DE LA TITULACIÓN

De mi consideración:

El presente trabajo de titulación **"Desequilibrios de la Fuerza de Velocidad"** realizado por Ramón Francisco, ha sido orientado y revisado durante su ejecución, por cuanto se aprueba la presentación del mismo.

Loja, septiembre de 2019

f) .....

DECLARACIÓN DE AUTORÍA Y CESIÓN DE DERECHOS

"Yo *Ramón Francisco* declaro ser autor del presente trabajo de titulación: **Desequilibrios de la Fuerza de Velocidad**, de la Titulación de *Maestría en Ciencias y Tecnologías de la Computación*, siendo *Joe West* director del presente trabajo; y eximo expresamente a la Universidad Técnica Particular de Loja y a sus representantes legales de posibles reclamos o acciones legales. Además certifico que las ideas, conceptos, procedimientos y resultados vertidos en el presente trabajo investigativo, son de mi exclusiva responsabilidad.
Adicionalmente declaro conocer y aceptar la disposición del Art. 88 del Estatuto Orgánico de la Universidad Técnica Particular de Loja que en su parte pertinente textualmente dice: "Forman parte del patrimonio de la Universidad la propiedad intelectual de investigaciones, trabajos científicos o técnicos y tesis de grado o trabajos de titulación que se realicen con el apoyo financiero, académico o institucional (operativo) de la Universidad"

f. .....
Autor: Ramón Francisco
Cédula: 0123456789

DEDICATORIA

En este espacio puedes ubicar la dedicatoria. Se ha agregado texto de relleno a continuación, para verificación del formato.

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. There is no need for special content, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^n b}$.

AGRADECIMIENTO

En este espacio puedes ubicar los agradecimientos. Se ha agregado texto de relleno a continuación, para verificación del formato.

Hello, here is some text without a meaning. $\mathrm{d}\Omega = \sin\vartheta \mathrm{d}\vartheta \mathrm{d}\varphi$. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. $\sin^2(\alpha) + \cos^2(\beta) = 1$. This text should contain all letters of the alphabet and it should be written in of the original language $E = mc^2$. There is no need for special content, but the length of words should match the language. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$.

ÍNDICE DE CONTENIDOS

LISTA DE FIGURAS

LISTA DE TABLAS

RESUMEN

El resumen se presentará en un máximo 180 palabras; sintetiza el aporte que brinda el trabajo realizado. Se ha agregado texto de relleno a continuación, para verificación del formato.

Hello, here is some text without a meaning. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. This text should show what a printed text will look like at this place. $a\sqrt[n]{b} = \sqrt[n]{a^n b}$. If you read this text, you will get no information. $\mathrm{d}\Omega = \sin\vartheta \mathrm{d}\vartheta \mathrm{d}\varphi$. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special content, but the length of words should match the language. $\sin^2(\alpha) + \cos^2(\beta) = 1$.

PALABRAS CLAVES: Palabras, Claves, Trabajo de Titulación

ABSTRACT

En este espacio puedes escribir el abstract, generalmente alrededor de 400 palabras. Se ha agregado texto de relleno a continuación, para verificación del formato.

Hello, here is some text without a meaning $E = mc^2$. This text should show what a printed text will look like at this place. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. If you read this text, you will get no information. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. $a\sqrt[n]{b} = \sqrt[n]{a^n b}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\mathrm{d}\Omega = \sin\vartheta \mathrm{d}\vartheta \mathrm{d}\varphi$. There is no need for special content, but the length of words should match the language.

KEYWORDS: Keywords, Thesis, Engineering

LISTA DE ABREVIATURAS

UTPL	Universidad Técnica Particular de Loja
DCCE	Departamento de Ciencias de la Computación y Electrónica
SET	Sección de Electrónica y Telecomunicaciones
MIMO	*Multiple-input multiple-output*
OFDM	*Orthogonal frequency division multiplexing*

LISTA DE SÍMBOLOS

c	Speed of light
λ	wavelength
π	number pi

INTRODUCCIÓN

Introducción, se presentará en un máximo de dos páginas y debe contener de forma resumida los siguientes puntos:

a. En qué consiste el tema desarrollado,
b. Una breve explicación de los capítulos,
c. La importancia que tiene la investigación para la institución, empresa o usuarios y la sociedad en general,
d. Cómo dio respuesta al problema planteado,
e. El alcance de los objetivos y su cumplimiento,
f. Las facilidades u oportunidades, los inconvenientes o limitantes con los que se enfrentó en el desarrollo del trabajo,
g. La metodología utilizada.

SECTION 1

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. There is no need for special content, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^n b}$.

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SUBSECTION 1

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SUBSUBSECTION 1

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CHAPTER 1

FORMATO DE LOS CAPÍTULOS

1.1. Descripción de la plantilla

1.2. Cómo iniciar la escritura de una tesis nueva con la plantilla

Los pasos que debe seguir para empezar la escritura de una tesis nueva con la plantilla `ThesisUTPL.cls` son los siguientes:

1. Descargar los documentos de la plantilla de https://github.com/fasandovaln/ThesisUTPL.
2. Duplicar la carpeta de ejemplo que ha descargado.
3. Abrir el fichero "`main_Thesis.tex`" con su editor preferido de LaTeX.
4. Guarde el archivo con un nuevo nombre.
5. Antes de realizar cualquier cambio, compile el archivo para verificar que no existe ningún error. Luego de la compilación debería obtener como resultado un documento similar a este. Puede requerir instalar nuevos paquetes a su distribución o actualizarla para compilar correctamente.
6. Seleccione las opciones de la clase de acuerdo a su necesidad.
7. Modifique la información básica de acuerdo a su caso.
8. Tenga en cuenta que se ha creado una carpeta para las figuras y otra para los documentos. Trate de mantener ese orden. En la carpeta "DOCUMENTS" se encuentran archivos "`.tex`" que corresponden a las diferentes partes del documento.
9. Escriba cada capítulo en un fichero "`.tex`" independiente y guárdelo en la carpeta "DOCUMENTS". Agréguelos en el punto del documento deseado utilizando para ello el comando:

   ```
   \input{DOCUMENTS/nombre_del_fichero.tex}.
   ```

10. Utilice las indicaciones dadas en este capítulo para el manejo de figuras, tablas, ecuaciones, etc. Además, recuerde compilar frecuentemente el documento.
11. **Sugerencia:** Recuerde revisar, previo a la presentación final de su tesis en Biblioteca, el repositorio de la plantilla, ya que se realizan actualizaciones en relación a los cambios sugeridos por Biblioteca o los errores reportados.

1.3. Estructura del documento que se genera

El documento final generado (en formato PDF) tendrá la siguiente estructura:

- **Carátula**. La información de la carátula se modifica en el archivo principal en la sección: Información básica del documento.
- **Aprobación del Director del Trabajo de Titulación**. La información se genera automáticamente, no es necesario realizar cambios.
- **Declaración de Autoría y Cesión de Derechos**. La información se genera automáticamente, no es necesario realizar cambios.
- **Dedicatoria**. La información de la dedicatoria puede ser ingresada en el archivo PRE-CAPÍTULOS.
- **Agradecimiento**. La información de los agradecimientos puede ser ingresado en el archivo PRE-CAPÍTULOS.
- **Índice de Contenidos**. El Índice de Contenidos se genera automáticamente.
- **Lista de Figuras**. La Lista de Figuras se genera automáticamente.
- **Lista de Tablas**. La Lista de Tablas se genera automáticamente.
- **Resumen y Palabras Claves**. La información del Resumen y las Palabras Claves puede ser ingresado en el archivo PRE-CAPÍTULOS.
- **Abstract and Keywords**. La información del Abstract y los Keywords puede ser ingresado en el archivo PRE-CAPÍTULOS.
- **Lista de Abreviaturas**. (Opcional) La información de la Lista de Abreviaturas puede ser ingresada en el archivo PRE-CAPÍTULOS. Si no va a utilizar esta sección puede comentarla.
- **Lista de Símbolos**. (Opcional) La información de la Lista de Símbolos puede ser ingresada en el archivo PRE-CAPÍTULOS. Si no va a utilizar esta sección puede comentarla.
- **Introducción**. Emplee el archivo INTRODUCCIÓN que se encuentra en la carpeta DOCUMENTS para escribir la introducción. Puede emplear secciones, subsecciones o párrafos, sin embargo, estos no se numeran.
- **Capítulos de la Tesis**. Se recomienda escribir cada capítulo en un archivo diferente. Los capítulos agregados aquí son únicamente de ejemplo. Usted puede comentarlos y agregar sus archivos.
- **Conclusiones**. Las conclusiones deben ser agregadas en el archivo CONCLUSIONES que se encuentra en la carpeta DOCUMENTS. Igual que la Introducción puede emplear secciones o subsecciones pero estas no se numerarán.

- **Recomendaciones**. Las recomendaciones deben ser agregadas en el archivo RECOMENDACIONES que se encuentra en la carpeta DOCUMENTS. Igual que la Introducción puede emplear secciones o subsecciones pero estas no se numerarán.
- **Bibliografía**. Se puede escoger entre dos estilos para citar: APA o IEEE.
- **Anexos**. Se recomienda crear los Anexos en archivos separados. El archivo ANEXO1 es un ejemplo que puede comentar para incluir su información.

1.4. Clase de documento y opciones

Para utilizar la plantilla se debe emplear la clase creada para el efecto de la siguiente manera:

```
\documentclass[unAutor, APA, hiperenlaces]{ThesisUTPL}
```

Las posibles opciones con las que se puede configurar el documento son:

1. **Cantidad de autores de la tesis:** Se emplea para indicar la cantidad de autores de la tesis. Esto genera algunos cambios en la carátula, y páginas iniciales que son generadas automáticamente.
   Opciones posibles: “unAutor”, “dosAutores”, “tresAutores”.
   Valor por defecto: “unAutor”.
2. **Estilo de Bibliografía:** Permite determinar el estilo para la bibliografía y las citas en el texto.
   Opciones posibles: “APA”, “IEEE”.
   Valor por defecto: “APA”.
   Nota: Por favor considerar las instrucciones de compilación sugeridas en la Sección 1.6.4.
3. **Hiperenlaces:** Permite habilitar los hiperenlaces a lo largo de todo el documento. Esto cubre el índice de contenidos, enlaces url, citas, y otros.
   Opción posible: “hiperenlaces”.

1.5. Paquetes empleados en la plantilla

A continuación se presenta los paquetes empleados en la plantilla. Usted puede agregar paquetes adicionales de acuerdo a su necesidad en el archivo “`0_PREAMBULO.tex`” que

se encuentra en la carpeta “DOCUMENTS”. Sin embargo, recuerde que algunos paquetes pueden ser incompatibles con otros por lo que es importante que verifique si el paquete que va a agregar es compatible con los empleados en la plantilla. Los paquetes empleados son los siguientes:

`ifthen`	*Conditional commands in LaTeX documents.*
`inputec`	*Accept different input encodings. Opción: utf8.*
`fontenc`	*Standard package for selecting font encodings. Opción: T1.*
`setspace`	*Spacing between lines*
`babel`	*Simplified Spanish support for Babel (hyphenation). Opción: spanish.*
`helvet`	*URW Arial font pack for use with LATEX. Opción: scaled*
`amsmath`	*Soport math simbols-fonts.*
`amssymb`	*Soport math simbols-fonts.*
`amsfonts`	*Soport math simbols-fonts.*
`latexsym`	*Soport math simbols-fonts.*
`graphicx`	*Enhanced support for graphics.*
`xcolor`	*Driver-independent color extensions for LATEX and pdfLATEX. Opciones: x11names, table.*
`subfigure`	*Figures divided into subfigures.*
`longtable`	*Allow tables to flow over page boundaries.*
`multirow`	*Create tabular cells spanning multiple rows.*
`booktabs`	*Publication quality tables in LATEX*
`listings`	*source code printer for LATEX*
`enumitem`	*Customize lists*
`morefloats`	*Increase the number of simultaneous LATEX floats. Opción: maxfloats=25.*
`url`	*Verbatim with URL-sensitive line breaks. Opción: hyphens.*
`hyperref`	*Extensive support for hypertext in LATEX. Opción: breaklinks=true.*
`titlesec`	*Modify title format.*
`appendix`	*Modifying the typesetting of appendix titles.*
`vmargin`	*Margins and paper sizes.*
`fancyhdr`	*Page layout.*

`caption`	*The caption package provides many ways to customise the captions in-floating environments such figure and table.*
`natbib`	*package that implements both author-year and numbered references.*

1.6. Particularidades de la plantilla

A continuación se presenta algunos ejemplos de opciones que pueden usarse en el transcurso de la redacción, a saber: figuras, tablas, referencias, ecuaciones, etc.

1.6.1. Figuras

Para las figuras emplee el entorno "figure" según el ejemplo mostrado en la Fig. 1.1. Emplee el comando `\captionsetup{width=n\textwidth}` donde "n" es un número entre 0 y 1 que representa el espacio que ocupa el título de la figura en relación al ancho del texto. Este parámetro debe ajustarse en razón del tamaño de la figura respecto al ancho de la página. Por otra parte, el comando `\FigExtraCaptionUTPL{}{}` permite introducir la "Fuente" y "Elaborado por", respectivamente. Los demás comandos son los habituales.
Para referirse a una figura en el texto emplee el comando `\ref{}` incluyendo la etiqueta que corresponda. También se puede emplear el comando `\autoref{}`, por ejemplo: Figure 1.1. La diferencia radica en que al emplear Figure 1.1 el comando agrega la palabra reservada según el tipo de entorno que se utilice, en este caso, "Figura". Cuando emplea `\ref{}` usted debe agregar la palabra "Figura" por teclado.
Además, recuerde que está incluido en la plantilla el paquete `subfigure` que le permite incluir sub-figuras en el texto.

1.6.2. Tablas

Para la elaboración de tablas se recomienda usar el entorno "table". De acuerdo al ejemplo presentado (ver Tabla 1.2). Emplee el comando `\captionsetup{width=n\textwidth}` donde "n" es un número entre 0 y 1 que representa el espacio que ocupa el título de la tabla en relación al ancho del texto. Este parámetro debe ajustarse en razón del tamaño de la tabla respecto al ancho de la página. Por otra parte, el comando `\FigExtraCaptionUTPL{}{}`

Figure 1.1: Campus UTPL

Fuente: UTPL (2008)
Elaborado por: UTPL

Figure 1.2: Mural del número π en el Campus de la UTPL: Mosaico de 1800 cifras decimales diseñado por Hno. Ticiano García (1974).

Fuente: Autor
Elaborado por: Autor

permite introducir la “Fuente” y “Elaboración”, respectivamente. Los demás comandos son los habituales.

Para referirse a una tabla en el texto emplee el comando `\ref{}` incluyendo la etiqueta que corresponda. También se puede emplear el comando `\autoref{}`, por ejemplo: Table 1.2.

En el caso de tener en su texto tablas extensas de más de una página, puede emplear

Tabla 1.2: Ejemplo de tabla

Columna 1	**Columna 2**	**Columna 3**
ítem 1	ítem 2	ítem 3
ítem 4	ítem 5	ítem 6
ítem 7	ítem 8	ítem 9

Fuente: Autor
Elaborado por: Autor

el entorno `longtable` cuyo paquete ya se encuentra adicionado al formato. Sin embargo, debe emplear `\FigExtraCaptionUTPLLongtable{}{}` para agregar la fuente y la elaboración. En la Table 1.3 se presenta un ejemplo.

Tabla 1.3: Un ejemplo simple de tabla larga

Primera columna	**Segunda columna**	**Tercera columna**	**Cuarta columna**
1	2	3	4
1	2	3	4
1	2	3	4
1	2	3	4
1	2	3	4
1	2	3	4
1	2	3	4
1	2	3	4
1	2	3	4
1	2	3	4
1	2	3	4
1	2	3	4
1	2	3	4
1	2	3	4
1	2	3	4
1	2	3	4
1	2	3	4
1	2	3	4
1	2	3	4
1	2	3	4
1	2	3	4
1	2	3	4
1	2	3	4

Tabla 1.3: (continuación)

Primera columna	Segunda columna	Tercera columna	Cuarta columna
1	2	3	4
1	2	3	4
1	2	3	4
1	2	3	4
1	2	3	4
1	2	3	4
1	2	3	4
1	2	3	4
1	2	3	4
1	2	3	4
1	2	3	4
1	2	3	4
1	2	3	4
1	2	3	4

Fuente: Autor
Elaborado por: Autor

1.6.3. Ecuaciones

Para las ecuaciones numeradas emplee el entorno “equation” (ver (1.1)). Las ecuaciones se numeran por capítulo. Emplee `\eqref{}` para referirse a una ecuación particular.

$$C = B \log_2 \left(1 + \frac{S}{N}\right) \tag{1.1}$$

1.6.4. Bibliografía

La plantilla permite utilizar dos estilos para citar, a saber: APA e IEEE. Pueden elegirse como opción de la clase *ThesisUTPL*. El estilo APA se encuentra por defecto. Para citar empleando el estilo APA se utiliza *natbib* y para el estilo IEEE *bibtex*.
Puede agregar más de un archivo de bibliografía. Como ejemplo la plantilla presenta el archivo “`BibliographyUTPL`” el cual se encuentra en la carpeta comprimida de la plantilla en el mismo nivel de carpetas que el archivo principal “`main_Thesis.tex`”.

En el caso de emplear el estilo APA, usted puede citar empleando el comando estandar de Latex "\cite{}" o \citet{} si lo que desea es realizar una cita en donde se enfatiza al autor. Si desea realizar una cita en donde se enfatiza el texto, en cuyo caso la cita debe salir entre paréntesis, emplee el comando "\citep{}". Note que para citas enfatizando el texto lo correcto es emplear el comando "\citep{}" y no es igual que poner entre paréntesis el comando "\cite{}". Además, cuando utilice el estilo APA, **recuerde siempre** agregar el campo "year" en cada referencia agregada en el archivo ".bib", ya que la ausencia del campo un una sola referencia, genera errores en la compilación de todas la bibliografía.
Por ejemplo, la siguiente es una cita empleando "\cite{}": Sandoval et al. (2017).
En el caso de emplear el estilo IEEE, **únicamente puede citar con** "\cite{}".
En el archivo "BibliographyUTPL" se presentan ejemplos de como ingresar diferentes fuentes bibliográficas, como por ejemplo: libros, artículos, tesis, etc.
Si usted desea cambiar entre un estilo u otro (IEEE o APA), es preferible que previo a realizar el cambio y compilar, borre los archivos auxiliares para evitar errores inesperados.

CHAPTER 2

Heading on Level 0 (chapter)

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. There is no need for special content, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^n b}$.

2.1. Heading on Level 1 (section)

Hello, here is some text without a meaning. $\mathrm{d}\Omega = \sin\vartheta \mathrm{d}\vartheta \mathrm{d}\varphi$. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. $\sin^2(\alpha) + \cos^2(\beta) = 1$. This text should contain all letters of the alphabet and it should be written in of the original language $E = mc^2$. There is no need for special content, but the length of words should match the language. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$.

2.1.1. Heading on Level 2 (subsection)

Hello, here is some text without a meaning. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. This text should show what a printed text will look like at this place. $a\sqrt[n]{b} = \sqrt[n]{a^n b}$. If you read this text, you will get no information. $\mathrm{d}\Omega = \sin\vartheta \mathrm{d}\vartheta \mathrm{d}\varphi$. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special content, but the length of words should match the language. $\sin^2(\alpha) + \cos^2(\beta) = 1$.

2.1.1.1. Heading on Level 3 (subsubsection)

Hello, here is some text without a meaning $E = mc^2$. This text should show what a printed text will look like at this place. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. If you read this text, you will get no information. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. $a\sqrt[n]{b} = \sqrt[n]{a^n b}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\mathrm{d}\Omega = \sin\vartheta \mathrm{d}\vartheta \mathrm{d}\varphi$. There is no need for special content, but the length of words should match the language.

2.1.1.1.1. Heading on Level 4 (paragraph) Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. There is no need for special content, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^n b}$.

2.2. Lists

2.2.1. Example for list (itemize)

- First item in a list
- Second item in a list
- Third item in a list
- Fourth item in a list
- Fifth item in a list

2.2.1.1. Example for list (4*itemize)

- First item in a list
  - First item in a list

- First item in a list
  - First item in a list
    - First item in a list
    - Second item in a list
  - Second item in a list
- Second item in a list

- Second item in a list

2.2.2. Example for list (enumerate)

1. First item in a list
2. Second item in a list
3. Third item in a list
4. Fourth item in a list
5. Fifth item in a list

2.2.2.1. Example for list (4*enumerate)

1. First item in a list
   a. First item in a list
      i. First item in a list
         A. First item in a list
         B. Second item in a list
      ii. Second item in a list
   b. Second item in a list
2. Second item in a list

2.2.3. Example for list (description)

First item in a list

Second item in a list

Third item in a list

Fourth item in a list

Fifth item in a list

2.2.3.1. Example for list (4*description)

First item in a list

First item in a list

First item in a list

First item in a list

Second item in a list

Second item in a list

Second item in a list

Second item in a list

Hello, here is some text without a meaning. $\mathrm{d}\Omega = \sin\vartheta \mathrm{d}\vartheta \mathrm{d}\varphi$. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. $\sin^2(\alpha) + \cos^2(\beta) = 1$. This text should contain all letters of the alphabet and it should be written in of the original language $E = mc^2$. There is no need for special content, but the length of words should match the language. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$.

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{i=n} x_i = \frac{x_1 + x_2 + \ldots + x_n}{n}$$

Hello, here is some text without a meaning. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. This text should show what a printed text will look like at this place. $a\sqrt[n]{b} = \sqrt[n]{a^n b}$. If you read this text, you will get no information. $\mathrm{d}\Omega = \sin\vartheta \mathrm{d}\vartheta \mathrm{d}\varphi$. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special content, but the length of words should match the language. $\sin^2(\alpha) + \cos^2(\beta) = 1$.

$$\int_0^\infty e^{-\alpha x^2}\mathrm{d}x = \frac{1}{2}\sqrt{\int_{-\infty}^{\infty} e^{-\alpha x^2}\mathrm{d}x} \int_{-\infty}^{\infty} e^{-\alpha y^2}\mathrm{d}y = \frac{1}{2}\sqrt{\frac{\pi}{\alpha}}$$

Hello, here is some text without a meaning $E = mc^2$. This text should show what a printed text will look like at this place. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. If you read this text, you will get no information. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. $a\sqrt[n]{b} = \sqrt[n]{a^n b}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\mathrm{d}\Omega = \sin\vartheta \mathrm{d}\vartheta \mathrm{d}\varphi$. There is no need for special content, but the length of words should match the language.

$$\sum_{k=0}^{\infty} a_0 q^k = \lim_{n\to\infty} \sum_{k=0}^{n} a_0 q^k = \lim_{n\to\infty} a_0 \frac{1-q^{n+1}}{1-q} = \frac{a_0}{1-q}$$

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. There is no need for special content, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^n b}$.

$$x_{1,2} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-p \pm \sqrt{p^2 - 4q}}{2}$$

Hello, here is some text without a meaning. $\mathrm{d}\Omega = \sin\vartheta \mathrm{d}\vartheta \mathrm{d}\varphi$. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. $\sin^2(\alpha) + \cos^2(\beta) = 1$. This text should contain all letters of the alphabet and it should be written in of the original language $E = mc^2$. There is no need for special content, but the length of words should match the language. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$.

$$\frac{\partial^2\Phi}{\partial x^2} + \frac{\partial^2\Phi}{\partial y^2} + \frac{\partial^2\Phi}{\partial z^2} = \frac{1}{c^2}\frac{\partial^2\Phi}{\partial t^2}$$

Hello, here is some text without a meaning. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. This text should show what a printed text will look like at this place. $a\sqrt[n]{b} = \sqrt[n]{a^n b}$. If you read this text, you will get no information. $\mathrm{d}\Omega = \sin\vartheta \mathrm{d}\vartheta \mathrm{d}\varphi$. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special content, but the length of words should match the language. $\sin^2(\alpha) + \cos^2(\beta) = 1$.

CONCLUSIONES

En las conclusiones, se redactan los puntos más sobresalientes, debilidades o fortalezas de la entidad, empresa, proyecto o investigación, observados o descubiertos durante la ejecución del trabajo de fin de titulación.

And after the second paragraph follows the third paragraph. Hello, here is some text without a meaning $E = mc^2$. This text should show what a printed text will look like at this place. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. If you read this text, you will get no information. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. $a\sqrt[n]{b} = \sqrt[n]{a^n b}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\mathrm{d}\Omega = \sin\vartheta \mathrm{d}\vartheta \mathrm{d}\varphi$. There is no need for special content, but the length of words should match the language.

After this fourth paragraph, we start a new paragraph sequence. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. There is no need for special content, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^n b}$.

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. There is no need for special content, but the

length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^n b}$.

This is the second paragraph. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. There is no need for special content, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^n b}$.

And after the second paragraph follows the third paragraph. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. There is no need for special content, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^n b}$.

RECOMENDACIONES

En las recomendaciones para futuros estudios, se redactan las sugerencias para posibles investigaciones que surgieren del estudio realizado.

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ANEXOS

ANEXO A. Acelerador de Partículas del Laboratorio S.T.A.R. y sus Impactos en la Fuerza de Velocidad

After this fourth paragraph, we start a new paragraph sequence. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. There is no need for special content, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^n b}$.

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha)+\cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. There is no need for special content, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^n b}$.

This is the second paragraph. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. There is no need for special content, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^n b}$.

And after the second paragraph follows the third paragraph. Hello, here is some text without

a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. There is no need for special content, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^n b}$.

After this fourth paragraph, we start a new paragraph sequence. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. There is no need for special content, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^n b}$.

Ejmplo de figura en Anexo (ver Figure A.1).

Ejemplo de tabla en Anexo (ver Table A.1).

Tabla A.1: Ejemplo de tabla en Anexo

Columna 1	**Columna 2**	**Columna 3**
ítem 1	ítem 2	ítem 3
ítem 4	ítem 5	ítem 6
ítem 7	ítem 8	ítem 9

Fuente: Autor
Elaborado por: Autor

Figure A.1: Campus UTPL (Anexo)
Fuente: UTPL (2008)
Elaborado por: UTPL

ANEXO B. Flashpoint: Líneas de tiempo alternativas

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. There is no need for special content, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^n b}$.

This is the second paragraph. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. There is no need for special content, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^n b}$.

And after the second paragraph follows the third paragraph. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. There is no need for special content, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^n b}$.

After this fourth paragraph, we start a new paragraph sequence. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really?

Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. There is no need for special content, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^n b}$.
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B.1. Flashpoint

This is the second paragraph. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. There is no need for special content, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^n b}$.
And after the second paragraph follows the third paragraph. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language.

$\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. There is no need for special content, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^n b}$.

After this fourth paragraph, we start a new paragraph sequence. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. There is no need for special content, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^n b}$.

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This is the second paragraph. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. There is no need for special content, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^n b}$.