LATEX TEMPLATE FOR THE ELE2024 COURSEWORK

AN AUTHOR AND BART SOMEONE

1. Part A

1.1. Question Q1. You may format inline equations using the dollar sign like that $x = 1 = \alpha$ and $y = x^2 - \sqrt{z}$. Equations are like that:

$$x_{k+1} = Ax_k + Bu_k. \tag{1.1}$$

Here is an equation with the Laplace transform

$$\mathscr{L}\{e^{at}\} = \frac{1}{s-a}, \tag{1.2}$$

for all complex numbers $s \in \mathbb{C}$ with $\mathbf{re}(s) > a$. The inverse Laplace transform is denoted like this $\mathscr{L}^{-1}$.

1.2. Question Q2. Refer to other sections as Section 1.1. An example of a numbered list

(1) first item,
(2) second item.

Links are like that. We also have **boldface**, *italics*, *emphasised*, `truetype`, Small Caps and so on. Format your MATLAB code as follows:

```
% My code:
f = @(x) sin(x);
y = f(0.1);
```

1.3. More math. Denote the real numbers as $\mathbb{R}$ and the complex numbers as $\mathbb{C}$. Example of a limit:

$$z = \lim_{s \to 0^+} \frac{s+1}{s^3 + s^2 - 5s + 9}. \tag{1.3}$$

Another example

$$\lim_{s \to \infty} \frac{s+1}{s^3 + s^2 - 5s + 9}. \tag{1.4}$$

Example of an integral

$$\int_0^\infty e^{-s\tau} f(\tau) \mathrm{d}\tau. \tag{1.5}$$

Three aligned equations

$$a = 1, \tag{1.6}$$
$$b = 2, \tag{1.7}$$
$$c = 3. \tag{1.8}$$

Two aligned equations without equation numbers

$$\begin{aligned} a &= 1, \\ b &= 2. \end{aligned}$$

Mathematical derivations:

$$\begin{aligned} \frac{1}{2+3j} &= \frac{2-3j}{(2+3j)(2-3j)} \\ &= \frac{2-3j}{2^2+3^2} \\ &= \frac{2-3j}{13} \\ &= \frac{2}{13} - j\frac{3}{13}. \end{aligned} \tag{1.9}$$

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Some note goes here. Version 0.0.1. Last updated: January 25, 2020.

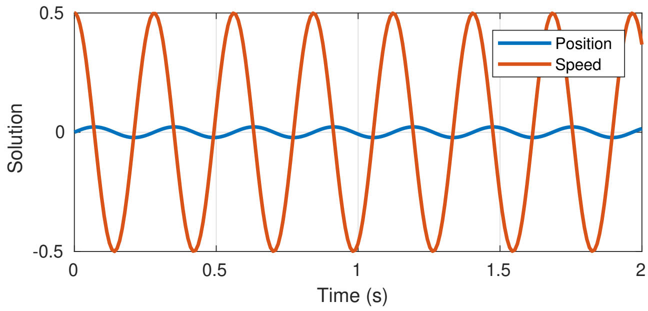

Figure 1. You may of course include figures in your document. It is best to use vector format graphics such as EPS files.

More mathematical derivations:

$$\begin{aligned} as + 4 + 2s &= b + (8+a)s \\ \Leftrightarrow (a+2)s + 4 &= b + (8+a)s \end{aligned}$$

Boldface math: $\boldsymbol{x}$. Vectors:

$$\boldsymbol{x} = \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix}. \tag{1.10}$$

Another example: According to Taylor's Theorem:

$$\phi(x) \approx \phi(x_0) + \phi'(x_0)(x - x_0). \tag{1.11}$$