Datiabasi Ibanga Gaius

17/ENGU2/029

COMPUTER ENGINEERING

ASSIGNMENT ✓

Mathematical modelling is a process that
Diagrams, scattered plots to represent rea

Hardware based Differential Equatio
Reactance decay Dynamic Systems

$T_{(0)} = 10°c$

$T_{E)} = 20°c$

Input $= 25°c$

$\dfrac{dT}{dt} = k(T - T_a)$

$\dfrac{dT}{k(T - T_a)} = kdt$

20
15
15

$$T = Ae^{kt} + T_A$$

at $T_{(0)} = 10°c$

$$10 = Ae^{k(0)} + 25$$
$$10 = A(1) + 25$$
$$10 = A + 25$$
$$10 - 25 = A$$
$$-15 = A$$
$$\therefore A = -15°C$$

$$T_{(t)} = 25 - 15e^{kt}$$

at $T_{(6)} = 20°C$

$$20 = 25 - 15e^{k(6)}$$

ii)

t	T
0	$25 - 15 * Exp(-0.22 * A2) = 10$
1	$25 - 15 * Exp(-0.22 \times A3) = 12.96222$
2	$25 - 15 * Exp(-0.22 \times A4) = 15.33945$
58	$25 - 15 * Exp(-0.22 \times A5) = 24.99996$
59	$25 - 15 * Exp(-0.22 \times A6) = 24.99997$
60	$25 - 15 * Exp(-0.22 \times A7) = 24.99997$

0   10   20   30   40   50

Command window

```
cloow
clc
Close all
t = [0:1:60]
T = 25-15*exp(-0.22*t)
Plot (t,T)
```