

# TOOLS FOR EMERGENCY REMOTE TEACHING

**MOHD. KAMARUDDIN BIN ABD. HAMID**

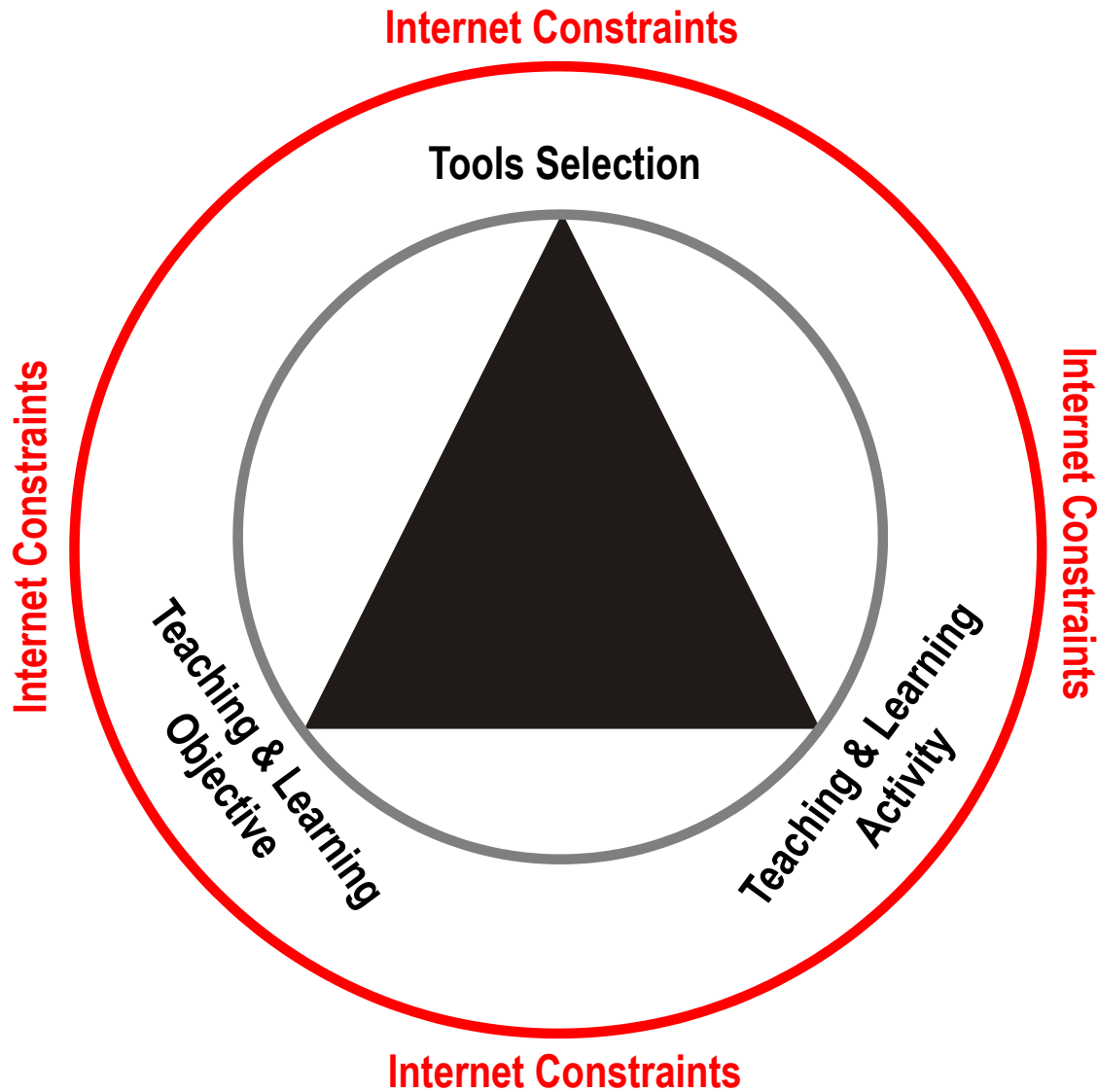
*UTM Support Group for 21<sup>st</sup> Century Teaching & Learning*



# TOOLS FOR EMERGENCY REMOTE TEACHING

- **ERT TOOLS SELECTION**
  - Constructive alignment
- **LEARNING MANAGEMENT SYSTEM**
- **EXAMPLES:**
  - Lectures
  - Class Discussion
  - Group Discussion





# ERT TOOLS SELECTION - CONSTRUCTIVE ALIGNMENT

- Tools Selection
- T&L Activity
- T&L Objective
- **Internet Constraints**



# Learning Management System (LMS)



Press F11 to exit full screen



## SKTK3564-01 KAWALAN PROSES DAN INSTRUMENTASI (PROCESS CONTROL & INSTRUMENTATION)



Home

My courses

SKTK3564-01

Your progress?



### SKTK 3564 PROCESS CONTROL & INSTRUMENTATION Section 01

Instructor:

Assoc. Prof. Ts. Dr. Mohd. Kamaruddin bin Abd. Hamid



Monday (2:00 – 4:00 PM) – N03 1-3

Wednesday (11:00 AM – 1:00 PM) – N03 2-7

# ERT TOOLS SELECTION - CONSTRUCTIVE ALIGNMENT

- Tools Selection
- T&L Activity
- T&L Objective
- **Internet Constraints**

T&L Activity:

**Online lecture**

T&L Objective:

Deliver content with the help of  
Microsoft Powerpoint

**Internet Constraint: No**

**Tool Selection: ?**



T&L Activity:

**Online lecture**

T&L Objective:

Deliver content with the help of  
Microsoft Powerpoint

**Internet Constraint: Yes**

**Tool Selection: ?**




5/11/2020

**Routh Stability Criterion**  
Online Process Control Tutorial Series: Routh Stability Criterion. This video shares three tips in [www.youtube.com](https://youtu.be/Tl7qxdv2-U)

**Routh Stability Criterion Checking**  
This video share 3 tips in checking Routh Stability Criterion.  
<https://youtu.be/Tl7qxdv2-U> 09:14 ✓

**CLASS ACTIVITIES 11 MAY 2020: 2:00 - 4:00 PM**

2:00 PM - Attendance  
2:05 PM - Problem 3B Progress Check using Google Jamboard.  
3:05 PM - Closed-Loop Stability Tutorial using WhatsApp. Please submit this tutorial solution by 10:00 AM, Tuesday 12 May 2020 through Submission: Closed Loop Stability Tutorial.  
3:45 PM - Closure 13:09 ✓

Online Process Control Tutorial Series 

**PROCESS CONTROL:**  
Tutorial Series  
**Routh Stability Criterion**

Assoc. Prof. Ts. Dr. Mohd. Kamaruddin bin Abd. Hamid  
UTM Chemical Engineering Lecturer

0:11 / 1:37

Routh Stability Criterion

# ERT TOOLS SELECTION - CONSTRUCTIVE ALIGNMENT

- Tools Selection
- T&L Objective
- T&L Activity
- **Internet Constraints**

T&L Activity:

**Online Class Discussion**

T&L Objective:

Discuss the content after online lectures

**Internet Constraint: No**

Tool Selection: ?







T&L Activity:

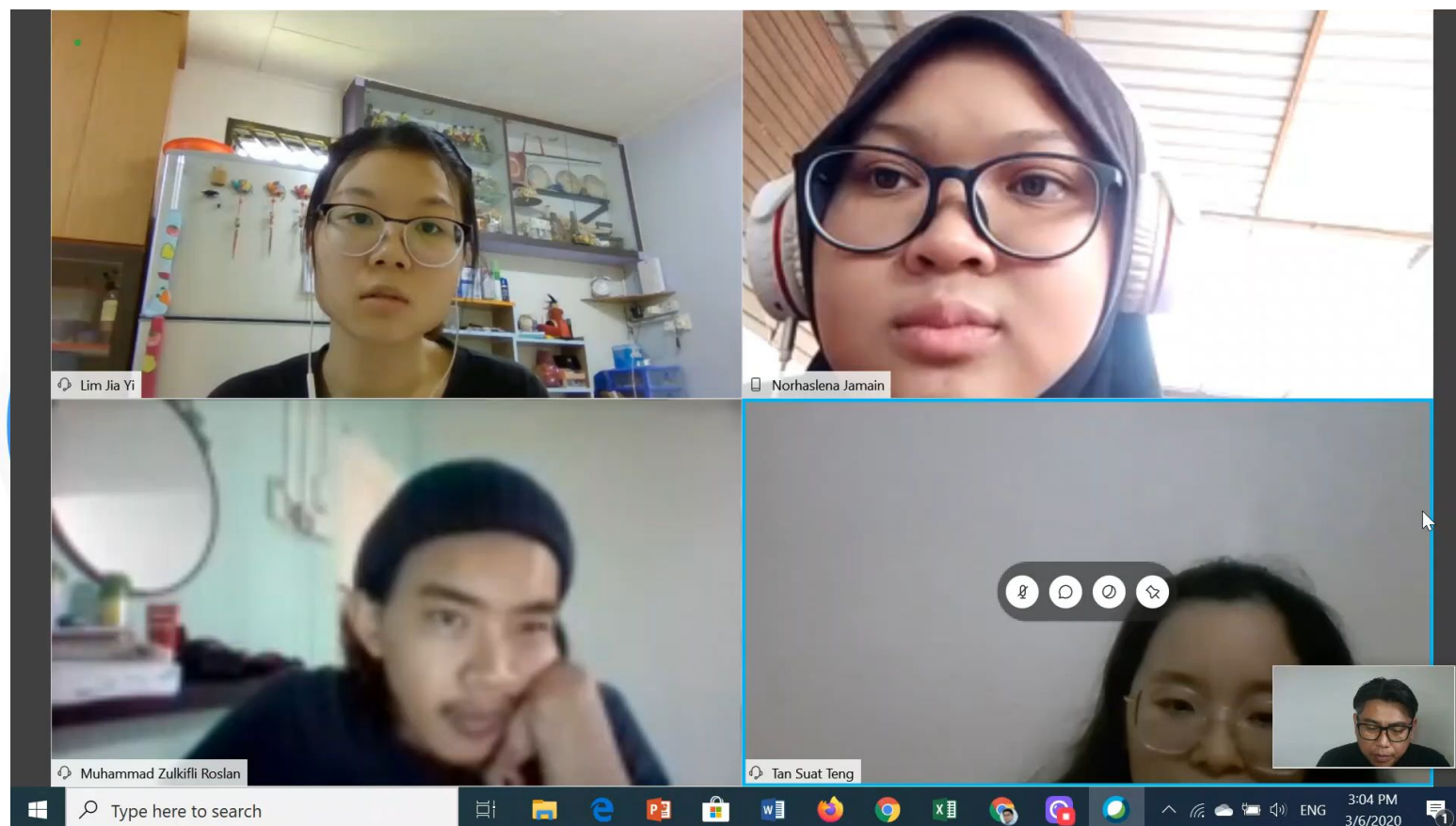
**Online Group Discussion**

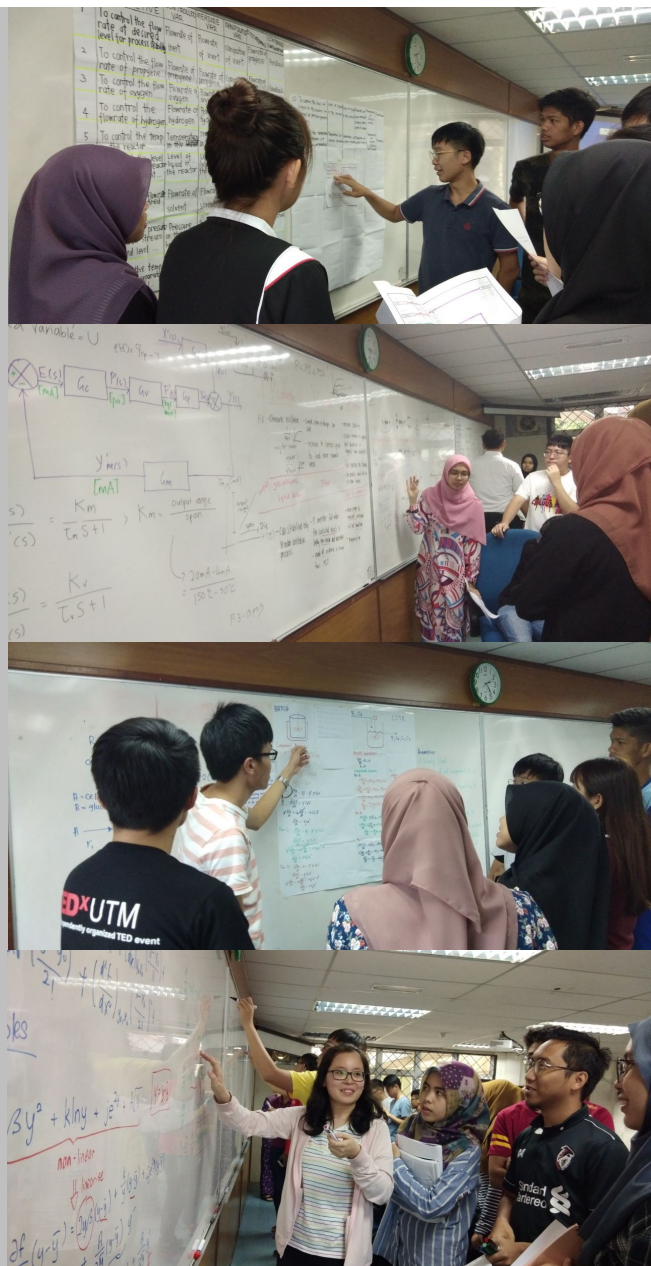
T&L Objective:

Discuss the content in group after online lectures

**Internet Constraint:**

**No**





T&L Activity:

T&L Objective:

**Online Group Discussion**

Discuss the content in group after online lectures

**Internet Constraint: Yes**

**Tool Selection: ?**

Problem 4 Team PTM

Background Clear frame

Open on a Jamboard

**Problem 4 Team 8 PTM**

NF=NV-NE;  
NF=no. of process variables;  
NV=no. of independent eq.  
NE=Total number of process variables

**control degree of freedom, NFC**

NF=NFC+ND;  
ND=number of DV  
NF=number of freedom

**selection of controlled, manipulated and measured variable**

Control variable? One manipulating must be control variable.  
① Choose output variable, disturbance to keep within tolerance and operating conditions.  
② direct measure of product quality.  
③ Interact with the control variable have dynamic, and static characteristic.  
④ large effect on controlled variable,  
⑤ inputs affect the controlled variable,  
⑥ affect the controlled variable directly and avoiding of disturbance.  
⑦ On reliability, accurate measurements are control (control) (control).  
⑧ have an adequate degree of sensitivity.  
⑨ minimize time delay and time constant.

**Cascade Control**

primary loop main secondary loop (slave)

only in one loop exchange disturbance and control

having 1 MV and more than 1 measurement

**Split Range Control**

-output of controller is split to 2 or more control valve

advantage: 1. control process effectively (more than 1 FCE)  
2. cheap and loading will be reduced because single controller for many FCE

eg. pressure / depressurize, heating / cooling, acid feed / base feed in neutralization

**Advance Control System**

**Ratio Control**

METHOD 1  
 $D=U/d$

METHOD 2  
 $KD=U/d$   
 $KI=U/d \cdot \Delta t$

Design criteria for feedforward

- The variable must influence the occurrence of an important disturbance
- There must not be a causal relationship between the manipulated and feedforward variable
- The disturbance dynamics must be slower than servo dynamics (when feedback control is present)

measure disturbance variable and take corrective action before they upset the process

two disturbances (load) are measured and held in constant ratio  
mostly used to control the ratio of flow rates of two streams  
both flow rates are measured but only one can be controlled  
the flow rate is not under control is usually referred as **wild stream**

# TOOLS FOR EMERGENCY REMOTE TEACHING

# THANK YOU

