MOTHEO TVET COLLEGE // ICT 4IR LABS PROJECT

FOR THE APPROVAL OF: ETDP SETA CEO:

PREPARED BY: BSC

DATE: *13 November 2024*
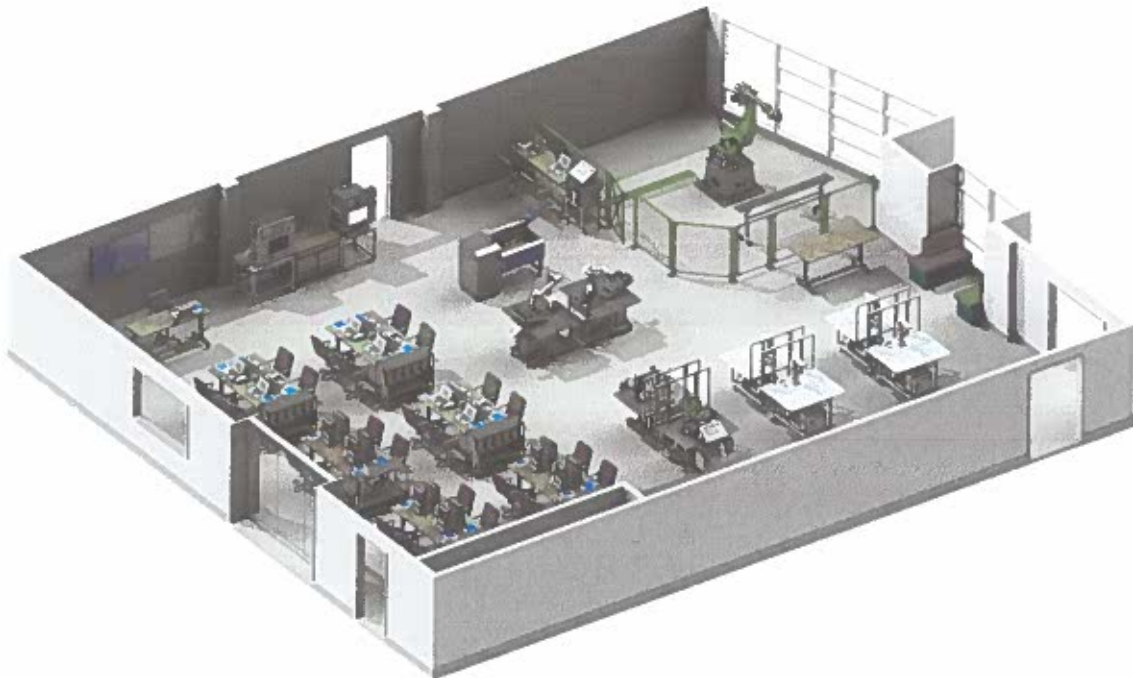
TITLE: 4IR LAB PROJECT

Lab Equipment Breakdown:

The envisaged systems that would be used within this project will be modular in nature, with possibility to upgrade it continuously when necessary.

Labs	Focus
Lab 1	- General Robotics - Introduction to Artificial Intelligence - Introduction IoT - Networking & 4G,5G
Lab 2	- Industrial Robotics - Artificial Intelligence - IoT Development - Cyber Security - VR/AR

Delivery and Installation must be completed by 15 February 2025

Layout and Resource requirements per Lab

Lab 1

https://www.youtube.com/watch?v=ki8eddxxeww

1. Lab with:
    a. 1 x Tower Servers
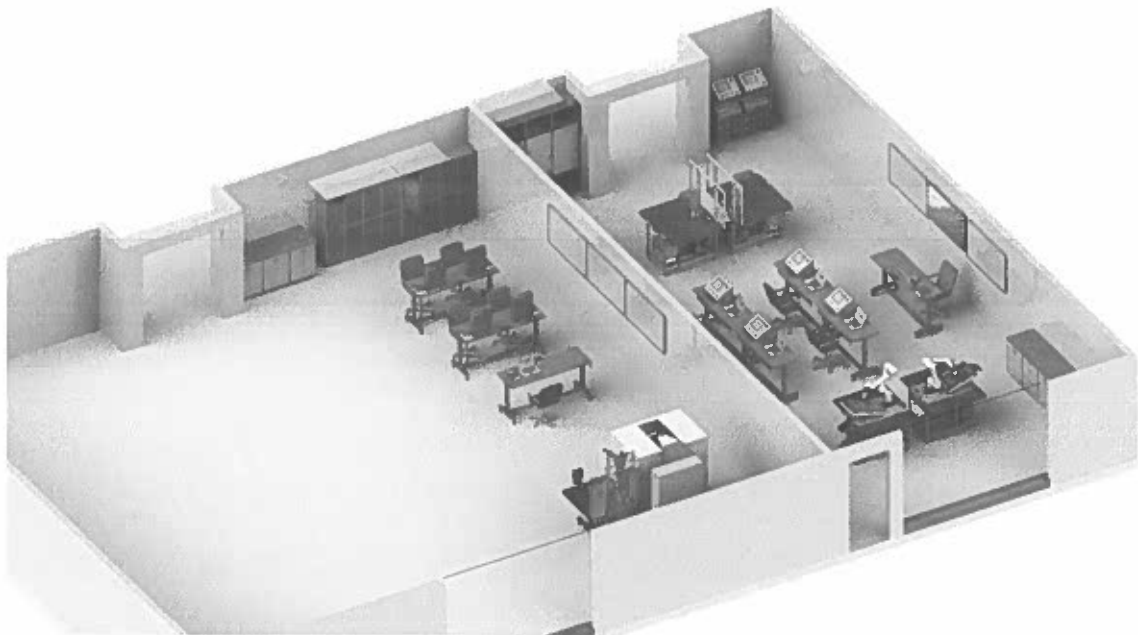   i. 1 x Intel® Xeon® 6960P Processor (432M Cache, 2.70 GHz) CPU or equivalent
        ii. 4x16GB DDR4 RAM – 64 GB total
        iii. 2 x 4TB 7.2k SATA 3.5" 6G HDD
        iv. PERC H330 PCIe RAID Controller
        v. H330 RAID Levels: 0, 1, 5, 6, 10, 50, 60
        vi. x4 way Backplane for up to 4 x 3.5" SATA Cabled Drives (Non Hot-Swap Drives)
        vii. Embedded 10Gbps Dual Port Network Integrated Card (2 x Ports)
        viii. Single Fixed Power Supply (1 x PSU)
        ix. iDRAC8 Basic
    b. 21 x Computers with the following specs:
        i. Core i7 Intel (11th Gen or higher) CPU
        ii. 32 GB RAM
        iii. Audio jack
        iv. 4GB Discrete GPU
        v. 2 or more USB3/3.1 ports
        vi. 2TB SSD or 1TB NVME Storage

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- vii. 19" Desktop Monitors
- viii. Keyboard & Mouse
- c. 4 x VR devices
    - i. Meta Quest VR Headset
    - ii. controllers
- d. 2 x 3D Printers
    - i. Min 300mm(W) x 220mm(D) x 350mm(H)
    - ii. Encased
    - iii. Removable bed
    - iv. 40 rolls of different coloured PLA filament
- e. 40 x Robotic kits
    - i. Robotic kit
    - ii. Raspberry Pi/Rock Pi 4/Asus Tinker Board
    - iii. Aduino Board
    - iv. Robotics Kit
- f. 1 x Niryo One 6 axis Robot Arm Educational use Ned2
- g. 40 x IoT kits
    - i. Raspberry Pi/Rock Pi 4/Asus Tinker Board with power cable, display cable and cover (select only one of the options, do not mix)
    - ii. Aduino Board
- h. Furniture
    - i. 1 x Instructor desks
    - ii. 1 x Instructor swivel chair with back support, wheels and arm rest (preferably dark colour)
    - iii. 20 x Adjustable Trapezoidal Student desks
    - iv. 20 x Student chairs with back support and wheels (preferably dark colour)
    - v. 1 x 65-inch Smart Screen (Wall moutable)
    - vi. 20 x Adjustable height movable work table
    - vii. 2 x 5 shelf lockable cabinets

Lab 2

https://www.youtube.com/watch?v=rRJb8r8qge8
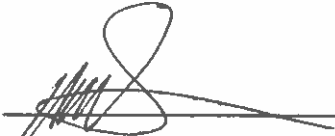
1. Lab with:
   a. 1 x Tower Servers
      i. 1 x Intel® Xeon® 6960P Processor (432M Cache, 2.70 GHz) CPU or equivalent
      ii. 4 x 16GB DDR4 RAM – 64 GB total
      iii. 2 x 4TB 7.2k SATA 3.5" 6G HDD
      iv. PERC H330 PCIe RAID Controller
      v. H330 RAID Levels: 0, 1, 5, 6, 10, 50, 60
      vi. x4 way Backplane for up to 4 x 3.5" SATA Cabled Drives (Non Hot-Swap Drives)
      vii. Embedded 10Gbps Dual Port Network Integrated Card (2 x Ports)
      viii. Single Fixed Power Supply (1 x PSU)
      ix. iDRAC8 Basic
   b. 21 x Computers with the following specs:
      i. Core i7 Intel (11th Gen or higher) CPU
      ii. 32 GB RAM
      iii. Audio jack
      iv. 4GB Discrete GPU
      v. 2 or more USB3/3.1 ports
      vi. 2TB SSD or 1TB NVME Storage
      vii. 19" Desktop Monitors
      viii. Keyboard & Mouse

    c. 1 x 3D Printers
- i. Min 300mm(W) x 220mm(D) x 350mm(H)
- ii. Encased
- iii. Removable bed
- iv. 20 rolls of different coloured PLA filament

    d. 40 x IoT kits
- i. Raspberry Pi/Rock Pi 4/Asus Tinker Board with power cable, display cable and cover (select only one of the options, do not mix)
- ii. Aduino Board

    e. Robotic Components:
- i. 1 x FANUC R2000iC/165F robot cell or Equivalent
- ii. 1 x Niryo One 6 axis Robot Arm Educational use Ned2
- iii. PLC Panel for R2000 robot or equivalent chosen

    f. Furniture
- i. 1 x Instructor desks
- ii. 1 x Instructor swivel chair with back support, wheels and arm rest (preferably dark colour)
- iii. 20 x Adjustable Trapezoidal Student desks
- iv. 20 x Student chairs with back support and wheels (preferably dark colour)
- v. 20 x Adjustable Trapezoidal Student desks
- vi. 1 x 65-inch Smart Screen (Wall moutable)
- vii. 20 x Adjustable height movable work table
- viii. 2 x 5 shelf lockable cabinets

Signatories

BSC Chairperson

Date 13/11/2024

Prof. MDM Phutsisi

Motheo TVET College Principal

Date 14/11/2024

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