



# Institute of Technology University of Kashmir

No: F(Activities/Engg.Kitchen)IoT/KU/26

Date: Aug 21, 2026

## Notification

The Institute of Technology shall be conducting a series of activities for the various equipment procured under the Engineering Kitchen initiative. The programmes have been designed to provide students with practical exposure to modern equipment, laboratory techniques, industrial practices and application-oriented engineering skills. The activities shall be conducted in the Engineering Kitchen Lab/respective laboratories/Engineering workshops of the Institute under the guidance of the designated faculty members/resource persons. The training programmes shall commence from **31st August 2026** and the programmes cover a wide range of technical areas, including:

1. Electrical Systems & Control Engineering
2. Smart Agriculture
3. Surveying & Geomatics
4. Geotechnical Engineering
5. Highway & Concrete Engineering
6. Advanced Manufacturing
7. Welding & Fabrication
8. Wood Processing & Digital Fabrication
9. Electronics Manufacturing & PCB Prototyping

The detailed programme schedule, including the equipment, dates, duration, activities, expected outcomes, venue/laboratory and designated resource persons/instructors, is enclosed herewith for information and necessary action. All concerned Coordinators/Faculty Members are requested to disseminate the schedule among the eligible students and encourage maximum participation in the programmes relevant to their respective disciplines.

Sd/-

Incharge,

Engineering Kitchen,

*Institute of Technology, Zakura Campus.*



# Institute of TECHNOLOGY

## University of Kashmir

The document outlines the various skill-oriented activities that can be conducted using the equipment procured under the Engineering Kitchen initiative, distributed across different laboratories of the Institute of Technology. The allocation of equipment to specific laboratories has been carried out based on its intended utilization and relevance to the respective disciplines. This arrangement ensures that students receive hands-on training through practical, application-oriented activities that are best suited to their academic programs and enhance their technical competencies.

| S. No.                                   | Equipment                                | Duration | Schedule (2026) | Skill-Oriented Activities                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Current Location of the Equipment        | Resource Persons/ Instructor                                                          |
|------------------------------------------|------------------------------------------|----------|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|---------------------------------------------------------------------------------------|
| Electrical Systems & Control Engineering |                                          |          |                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                          |                                                                                       |
| 1                                        | Power Quality Analyzer                   | 3 Days   | 31-Aug-2026     | Introduction to power quality concepts, electrical safety, IEEE standards, familiarization with analyzer components, probe connections, instrument configuration, measurement of single-phase and three-phase voltage, current and frequency, data recording.                                                                                                                                                                                                                        | Engineering Kitchen-1, Workshop Building | 1. Dr. Wardul Hijaz Paul<br>2. Er. G M Gudoo<br>3. Er. Muwahib<br>4. Er. Jaseera Khan |
|                                          |                                          |          | 1-Sep-2026      | Measurement of active, reactive and apparent power, power factor analysis, harmonic (THD) measurement, voltage sag, swell and flicker analysis, load profiling and interpretation of recorded data.                                                                                                                                                                                                                                                                                  |                                          |                                                                                       |
|                                          |                                          |          | 2-Sep-2026      | Energy auditing procedures, load survey, energy consumption analysis, identification of energy losses, preparation of energy audit report and recommendations for improving power quality and energy efficiency.                                                                                                                                                                                                                                                                     |                                          |                                                                                       |
|                                          | Lead-Acid Battery Characteristics System | 2 Days   | 3-Sep-2026      | Introduction to lead-acid batteries, construction, electrochemical principles, laboratory safety, charger operation, constant-current and constant-voltage charging, monitoring charging voltage, current and temperature, recording charging characteristics.                                                                                                                                                                                                                       | Engineering Kitchen-1, Workshop Building | 1. Dr. Wardul Hijaz Paul<br>2. Er. G M Gudoo<br>3. Er. Muwahib<br>4. Er. Jaseera Khan |
| 2                                        |                                          |          | 3-Sep-2026      | Battery discharge testing, capacity determination, efficiency calculation, depth of discharge (DoD), state of charge (SoC) estimation, charging and discharging curve plotting, performance comparison and data recording. Internal resistance measurement, battery health assessment, fault diagnosis, preventive maintenance, life-cycle analysis, battery performance comparison, preparation of battery performance evaluation report and discussion of industrial applications. |                                          |                                                                                       |
| 3                                        | Magnetic Levitation System               | 3 Days   | 4-Sep-2026      | Introduction to magnetic levitation principles, electromagnetic force, Hall-effect sensor operation, system components, hardware familiarization, wiring, sensor calibration, signal conditioning and preliminary testing. Mathematical modelling of the levitation system, open-loop control, response analysis, actuator behaviour, sensor feedback analysis, effect of supply voltage and system characterization.                                                                | Engineering Kitchen-1, Workshop Building | 1. Dr. Wardul Hijaz Paul<br>2. Er. G M Gudoo<br>3. Er. Muwahib<br>4. Er. Jaseera Khan |
|                                          |                                          |          | 7-Sep-2026      | PID controller design, controller tuning using proportional, integral and derivative gains, transient response analysis, oscillation control, error minimization and controller optimization. Closed-loop control, stability analysis, disturbance rejection, dynamic response evaluation, parameter optimization, comparison of controller performance under varying operating conditions.                                                                                          |                                          |                                                                                       |
|                                          |                                          |          | 8-Sep-2026      | System troubleshooting, performance validation, optimization of controller parameters, documentation of experimental observations, demonstration of stable levitation system and project evaluation.                                                                                                                                                                                                                                                                                 |                                          |                                                                                       |
| Smart Agriculture                        |                                          |          |                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                          |                                                                                       |
| 4                                        | Plant Growth Chamber                     | 3 Days   | 9-Sep-2026      | Introduction to controlled environment agriculture, familiarization with plant growth chamber components, laboratory safety, calibration of temperature, humidity and illumination systems, environmental parameter settings. Seed selection, seed treatment, preparation of growth media, sowing techniques, germination studies, environmental monitoring and observation recording.                                                                                               | Engineering Kitchen-2, Workshop Building |                                                                                       |
|                                          |                                          |          | 10-Sep-2026     | Climate control, photoperiod programming, hydroponic nutrient preparation, irrigation management, monitoring of plant growth parameters and environmental optimization. Plant growth measurements, stress analysis, nutrient deficiency identification, disease observation, environmental parameter optimization, recording and interpretation of experimental data.                                                                                                                |                                          |                                                                                       |
|                                          |                                          |          | 11-Sep-2026     | Comparative analysis of plant growth under different environmental conditions, statistical interpretation of results, report preparation, presentation of findings and discussion of applications in smart agriculture.                                                                                                                                                                                                                                                              |                                          |                                                                                       |

## Skill-oriented activities, Engineering Kitchen

| Surveying & Geomatics    |                                                     |        |             |                                                                                                                                                                                                                                                                                                                                                                                                 |                                          |                                                                       |
|--------------------------|-----------------------------------------------------|--------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|-----------------------------------------------------------------------|
| 5                        | Advanced Total Station                              | 3 Days | 14-Sep-2026 | Introduction to Total Station, instrument components, centering, leveling, prism handling, coordinate system, instrument calibration, basic field setup and safety precautions.<br>Measurement of horizontal and vertical angles, slope and horizontal distances, coordinate determination, field data collection, accuracy verification and instrument adjustments.                            | Engineering Kitchen-2, Workshop Building | 1. Dr. Ilyas<br>2. Dr. Ishfaq Mohi din<br>3. Er. Umar<br>4. Er. Waqar |
|                          |                                                     |        | 15-Sep-2026 | Traverse survey, station establishment, backsight and foresight observations, traverse adjustment, error analysis and field note preparation.<br>Topographic survey, contour mapping, road alignment survey, feature coding, data acquisition and field verification.                                                                                                                           |                                          |                                                                       |
|                          |                                                     |        | 16-Sep-2026 | Data transfer to computer, CAD processing, contour generation, topographic map preparation, report preparation and project presentation.                                                                                                                                                                                                                                                        |                                          |                                                                       |
| Geotechnical Engineering |                                                     |        |             |                                                                                                                                                                                                                                                                                                                                                                                                 |                                          |                                                                       |
| 6                        | Sieves (Sieve Analysis Set)                         | 1 Day  | 17-Sep-2026 | Introduction to soil particle size analysis, sampling techniques, sample drying, weighing procedures, sieve selection, sieve shaker operation and laboratory safety practices.<br>Calculation of percentage retained and percentage passing, preparation of grain size distribution curve, soil classification using IS standards, interpretation of results and laboratory report preparation. | Engineering Kitchen-2, Workshop Building | 1. Dr. Ilyas<br>2. Dr. Minaam<br>3. Er. Umar<br>4. Er. Neelam         |
| 7                        | Rapid Moisture Content Test (Speedy Moisture Meter) | 1 Day  | 18-Sep-2026 | Introduction to field moisture determination, working principle of Speedy Moisture Meter, sample preparation, chemical reagent handling, moisture content determination, comparison with oven drying method, result interpretation and report preparation.                                                                                                                                      | Engineering Kitchen-2, Workshop Building | 1. Dr. Ilyas<br>2. Dr. Minaam<br>3. Er. Umar<br>4. Er. Neelam         |
| 8                        | Liquid Limit Test (Casagrande Apparatus)            | 2 Days | 21-Sep-2026 | Introduction to Atterberg limits, sample preparation, Casagrande apparatus familiarization, groove cutting technique, blow count procedure, moisture content determination and observation recording.                                                                                                                                                                                           | Engineering Kitchen-2, Workshop Building | 1. Dr. Ilyas<br>2. Dr. Minaam<br>3. Er. Salim<br>4. Er. Neelam        |
|                          |                                                     |        | 22-Sep-2026 | Flow curve plotting, determination of liquid limit, interpretation of soil consistency, soil classification according to IS standards, engineering applications and laboratory report preparation.                                                                                                                                                                                              |                                          |                                                                       |
| 9                        | Plastic Limit Test                                  | 2 Days | 23-Sep-2026 | Introduction to Atterberg limits and soil consistency, sample preparation, laboratory safety, rolling of soil threads, determination of plastic limit, observation recording and identification of changes in soil behavior during rolling.                                                                                                                                                     | Engineering Kitchen-2, Workshop Building | 1. Dr. Sabreena<br>2. Dr. Insha<br>3. Er. Salim<br>4. Er. Neelam      |
|                          |                                                     |        | 24-Sep-2026 | Determination of plasticity index using liquid and plastic limits, classification of fine-grained soils as per IS standards, interpretation of engineering properties, preparation of laboratory report and discussion of practical applications in foundation engineering.                                                                                                                     |                                          |                                                                       |
| 10                       | Shrinkage Limit Test                                | 2 Days | 25-Sep-2026 | Introduction to shrinkage characteristics of cohesive soils, sample preparation, shrinkage dish preparation, filling and leveling of soil specimen, oven drying procedure and measurement of shrinkage dimensions.                                                                                                                                                                              | Engineering Kitchen-2, Workshop Building | 1. Dr. Sabreena<br>2. Dr. Insha<br>3. Er. Salim<br>4. Er. Neelam      |
|                          |                                                     |        | 28-Sep-2026 | Determination of shrinkage limit, shrinkage ratio and volumetric shrinkage, interpretation of soil volume change characteristics, engineering significance and preparation of laboratory report.                                                                                                                                                                                                |                                          |                                                                       |
| 11                       | Compaction Mould & Rammer Set                       | 3 Days | 29-Sep-2026 | Introduction to soil compaction principles, Standard and Modified Proctor tests, sample preparation, moisture conditioning, mould assembly, compaction procedures and laboratory safety practices.                                                                                                                                                                                              | Engineering Kitchen-2, Workshop Building | 1. Dr. Sabreena<br>2. Dr. Insha<br>3. Er. Salim<br>4. Er. Neelam      |
|                          |                                                     |        | 30-Sep-2026 | Determination of dry density for different moisture contents, plotting moisture-density relationship, identification of Optimum Moisture Content (OMC), Maximum Dry Density (MDD) and comparison of compaction methods.                                                                                                                                                                         |                                          |                                                                       |
|                          |                                                     |        | 1-Oct-2026  | Interpretation of compaction curves, field applications of soil compaction, quality control during earthwork construction, report preparation and discussion of practical engineering applications.                                                                                                                                                                                             |                                          |                                                                       |
| 12                       | Proctor Penetrometer                                | 2 Days | 2-Oct-2026  | Introduction to Proctor Penetrometer, calibration, operating procedure, penetration testing on compacted soil specimens, correlation with compaction characteristics and data recording.                                                                                                                                                                                                        | Engineering Kitchen-2, Workshop Building | 1. Dr. Sabreena<br>2. Dr. Insha<br>3. Er. Salim<br>4. Er. Neelam      |
|                          |                                                     |        | 5-Oct-2026  | Verification of field compaction, interpretation of penetration values, comparison with laboratory compaction results, quality control assessment and preparation of field compaction report.                                                                                                                                                                                                   |                                          |                                                                       |
| 13                       | Direct Shear Test Apparatus                         | 3 Days | 6-Oct-2026  | Introduction to shear strength of soils, apparatus familiarization, sample preparation, specimen installation, application of normal load, calibration and laboratory safety.                                                                                                                                                                                                                   | Engineering Kitchen-2, Workshop Building | 1. Dr. Ishfaq<br>2. Dr. Nahida<br>3. Er. Salim<br>4. Er. Arsheena     |
|                          |                                                     |        | 7-Oct-2026  | Conducting direct shear tests under different normal loads, recording shear displacement and shear force, identification of failure conditions and observation of soil behavior.                                                                                                                                                                                                                |                                          |                                                                       |

## Skill-oriented activities, Engineering Kitchen

|                                |                                     |        |             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                          |                                                                         |
|--------------------------------|-------------------------------------|--------|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|-------------------------------------------------------------------------|
|                                |                                     |        | 8-Oct-2026  | Plotting shear stress versus normal stress graph, determination of cohesion (c) and angle of internal friction (ϕ), interpretation of results and preparation of laboratory report.                                                                                                                                                                                                                                                                                                                        |                                          | 4. Er. Arsheena                                                         |
| 14                             | Unconfined Compression Test Machine | 3 Days | 9-Oct-2026  | Introduction to unconfined compression testing, specimen preparation, machine components, calibration, loading procedures, laboratory safety and data recording methods.                                                                                                                                                                                                                                                                                                                                   | Engineering Kitchen-2, Workshop Building | 1. Dr. Ishfaq<br>2. Dr. Nahida<br>3. Er. Salim<br>4. Er. Arsheena       |
|                                |                                     |        | 12-Oct-2026 | Conducting UCS test on cohesive soil specimens, recording load-deformation characteristics, stress-strain analysis and identification of failure patterns.                                                                                                                                                                                                                                                                                                                                                 |                                          |                                                                         |
|                                |                                     |        | 13-Oct-2026 | Determination of unconfined compressive strength and undrained shear strength, interpretation of stress-strain behavior, engineering applications and preparation of laboratory report.                                                                                                                                                                                                                                                                                                                    |                                          |                                                                         |
| 15                             | Auger Sampler                       | 2 Days | 14-Oct-2026 | Introduction to soil exploration techniques, auger types, boring procedures, field safety, collection of disturbed soil samples, depth measurements and field logging.                                                                                                                                                                                                                                                                                                                                     | Engineering Kitchen-2, Workshop Building | 1. Dr. Ishfaq<br>2. Dr. Ilyas<br>3. Er. Salim<br>4. Er. Waqar           |
|                                |                                     |        | 15-Oct-2026 | Preparation of bore logs, identification of soil strata, sample labeling and preservation, interpretation of subsurface conditions and preparation of soil investigation report.                                                                                                                                                                                                                                                                                                                           |                                          |                                                                         |
| 16                             | Dial Gauges and Proving Rings       | 1 Day  | 16-Oct-2026 | Introduction to precision measuring instruments, dial gauge components, calibration procedures, measurement of displacement and deformation, alignment checking, dimensional inspection, error analysis and preparation of calibration report.<br>Introduction to proving rings and force measurement principles, calibration procedures, load verification using standard loads, determination of calibration constants, accuracy assessment, uncertainty analysis and preparation of calibration report. | Engineering Kitchen-2, Workshop Building | 1. Dr. Ishfaq<br>2. Dr. Ilyas<br>3. Er. Salim<br>4. Er. Waqar           |
| Highway & Concrete Engineering |                                     |        |             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                          |                                                                         |
| 18                             | Compaction Factor Test Apparatus    | 2 Days | 19-Oct-2026 | Introduction to concrete workability, significance of compaction factor test, apparatus familiarization, sample preparation, batching, mixing of concrete, laboratory safety, conducting compaction factor test and recording observations.                                                                                                                                                                                                                                                                | Engineering Kitchen-2, Workshop Building | 1. Dr. Ishfaq<br>2. Dr. Ilyas<br>3. Er. Salim<br>4. Er. Waqar           |
|                                |                                     |        | 20-Oct-2026 | Calculation of compaction factor, comparison with slump test, interpretation of workability characteristics, suitability of concrete mixes for different construction applications, preparation of laboratory report.                                                                                                                                                                                                                                                                                      |                                          |                                                                         |
| 19                             | CBR Mould Full Set                  | 2 Days | 21-Oct-2026 | Introduction to California Bearing Ratio (CBR) test, pavement engineering concepts, preparation of soil samples, moisture conditioning, compaction of specimens using CBR moulds and placement of surcharge weights.                                                                                                                                                                                                                                                                                       | Engineering Kitchen-2, Workshop Building | 1. Dr. Ishfaq<br>2. Dr. Ilyas<br>3. Er. Salim<br>4. Er. Waqar           |
|                                |                                     |        | 22-Oct-2026 | Soaking and curing procedures, preparation of specimens for penetration testing, quality inspection of prepared specimens, documentation of sample preparation and testing procedures.                                                                                                                                                                                                                                                                                                                     |                                          |                                                                         |
| 20                             | Digital CBR Apparatus               | 3 Days | 23-Oct-2026 | Introduction to Digital CBR Apparatus, calibration, specimen installation, loading frame operation, proving ring and displacement gauge verification, laboratory safety and testing procedure.                                                                                                                                                                                                                                                                                                             | Engineering Kitchen-2, Workshop Building | 1. Dr. Ishfaq<br>2. Dr. Ilyas<br>3. Er. Salim<br>4. Er. Waqar           |
|                                |                                     |        | 26-Oct-2026 | Conducting penetration test, recording load-penetration data, plotting load versus penetration curve, determination of CBR values at standard penetrations and comparison of soaked and unsoaked specimens.                                                                                                                                                                                                                                                                                                |                                          |                                                                         |
|                                |                                     |        | 27-Oct-2026 | Interpretation of CBR results for flexible pavement design, evaluation of subgrade strength, pavement thickness estimation, report preparation and discussion of highway engineering applications.                                                                                                                                                                                                                                                                                                         |                                          |                                                                         |
| Advanced Manufacturing         |                                     |        |             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                          |                                                                         |
|                                |                                     |        |             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                          |                                                                         |
| 21                             | Industrial SLA 3D Printer           | 4 Days | 28-Oct-2026 | Introduction to additive manufacturing, SLA printing technology, printer components, resin handling, laboratory safety, CAD model preparation and STL file generation.                                                                                                                                                                                                                                                                                                                                     | Engineering Kitchen-1, Workshop Building | 1. Dr. Summera Bandy<br>2. Er. Irfan<br>3. Er. Muzamil<br>4. Er. Mehnan |
|                                |                                     |        | 29-Oct-2026 | Slicing software, orientation of components, support structure generation, print parameter optimization, machine setup and execution of print jobs.                                                                                                                                                                                                                                                                                                                                                        |                                          |                                                                         |
|                                |                                     |        | 30-Oct-2026 | Post-processing of printed parts, resin cleaning, UV curing, support removal, dimensional inspection and surface finishing techniques.                                                                                                                                                                                                                                                                                                                                                                     |                                          |                                                                         |
|                                |                                     |        | 2-Nov-2026  | Evaluation of printed components, dimensional accuracy measurement, defect analysis, optimization of print quality, documentation and development of a functional prototype.                                                                                                                                                                                                                                                                                                                               |                                          |                                                                         |
|                                |                                     |        | 3-Nov-2026  | Introduction to Electrical Discharge Machining (EDM), machine components, dielectric system, electrode materials, safety precautions and machine setup. CNC programming, coordinate system, workpiece setting, electrode preparation, machining parameter selection and dry run operation.                                                                                                                                                                                                                 |                                          |                                                                         |

## Skill-oriented activities, Engineering Kitchen

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|---------------------------------------|----------------------------------------|--------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------------------------|
| 22                                    | EDM Machine                            | 3 Days | 4-Nov-2026  | Profile machining, cavity generation, spark gap control, monitoring machining performance and dimensional inspection of machined components. Manufacture of dies, punches and mould cavities, optimization of machining parameters, surface finish improvement and electrode wear analysis.                                                                                                                                                                             | CNC Lab, Department of Mechanical Engineering | 1. Dr. Summera Bandy<br>2. Er. Irfan<br>3. Er. Muzamil<br>4. Er Mehnan                   |
|                                       |                                        |        | 5-Nov-2026  | Manufacture of dies, punches and mould cavities, optimization of machining parameters, surface finish improvement and electrode wear analysis.<br>Inspection of finished components, dimensional verification using precision instruments, troubleshooting, preventive maintenance and project documentation.                                                                                                                                                           |                                               |                                                                                          |
|                                       | Mini Desktop Lathe cum Milling Machine | 2 Days | 6-Nov-2026  | Introduction to machine components, safety precautions, work holding devices, cutting tool selection, machine setup and basic operating procedures.<br>Turning, facing and step turning operations, measurement of dimensions using Vernier calipers and micrometers, dimensional accuracy verification. Drilling, boring and reaming operations, selection of cutting parameters, tool alignment and machining accuracy evaluation.                                    | Machine Shop                                  | 1. Dr. Mushtaq Ahmad Rather<br>2. Umar Fayaz<br>3. Er. Murtaza<br>4. Er Mehnan           |
|                                       |                                        |        | 9-Nov-2026  | Milling operations including slotting, keyway cutting, end milling and simple contour machining, inspection of machined features and process optimization. External threading, finishing operations, dimensional inspection, preparation of shafts, bushes or couplings, machine maintenance and documentation of machining process.                                                                                                                                    |                                               |                                                                                          |
| 24                                    | Bench Grinder Machine                  | 1 Day  | 10-Nov-2026 | Introduction to grinding processes, grinder components, safety practices, grinding wheel selection, wheel balancing, dressing and sharpening of single-point cutting tools. Grinding of drill bits, chisels and lathe tools, deburring of machined components, polishing techniques, inspection of cutting edge geometry and maintenance of grinding equipment.                                                                                                         | Machine Shop                                  | 1. Dr. Kaleem A Najar<br>2. Umar Fayaz<br>3. Er. Murtaza<br>4. Er Mehnan                 |
| Welding & Fabrication                 |                                        |        |             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                               |                                                                                          |
|                                       | Industrial TIG Welding Machine         | 3 Days | 11-Nov-2026 | Introduction to TIG welding, welding safety, machine components, shielding gases, tungsten electrode preparation, current selection and machine setup. Practice of straight beads on mild steel plates, torch handling techniques, filler rod manipulation, weld pool control and visual inspection of welds.                                                                                                                                                           | Welding Shop                                  | 1. Dr. Summera<br>2. Dr. Suhail Ahmad Manroo<br>3. Er. Murtaza<br>4. Er Mehnan           |
|                                       |                                        |        | 12-Nov-2026 | Butt joints, lap joints and fillet joints on steel specimens, optimization of welding parameters and defect identification. TIG welding of stainless steel and aluminium, heat input control, distortion minimization, welding quality inspection and non-destructive visual examination.<br>Fabrication of laboratory frame, table or pipe assembly, final inspection of welded structure, finishing operations, troubleshooting and documentation of welding project. |                                               |                                                                                          |
|                                       | Industrial MIG Welding Machine         | 3 Days | 13-Nov-2026 | Introduction to MIG welding, safety precautions, shielding gases, wire feed mechanism, machine setup, selection of welding parameters and equipment calibration. Practice of bead welding on mild steel, control of wire feed speed and voltage, weld bead inspection and correction of welding defects.                                                                                                                                                                | Welding Shop                                  | 1 Dr. Ishfaq Amin Makaci<br>2. Dr. Suhail Ahmad Manroo<br>3. Er. Murtaza<br>4. Er Mehnan |
|                                       |                                        |        | 16-Nov-2026 | Fabrication of butt, lap and fillet joints, positional welding, parameter optimization and weld quality evaluation. Fabrication of structural components such as racks, frames and brackets, dimensional verification, distortion control and finishing operations.<br>Inspection of welded assembly, troubleshooting, documentation, preparation of welding report and discussion of industrial applications.                                                          |                                               |                                                                                          |
| Wood Processing & Digital Fabrication |                                        |        |             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                               |                                                                                          |
| 27                                    | Mini Band Saw                          | 2 Days | 17-Nov-2026 | Introduction to woodworking safety, components and working principle of the mini band saw, blade selection, blade tensioning and tracking, workpiece marking, machine setup, straight cutting techniques and safe operating practices.                                                                                                                                                                                                                                  | Carpentry Shop                                | 1. Dr. Kaleem A Najar<br>2. Er. Saba Yaseen<br>3. Er. Murtaza<br>4. Er Mehnan            |
|                                       |                                        |        | 18-Nov-2026 | Curved cutting, circular cutting, bevel and mitre cutting, cutting optimization, edge finishing, dimensional inspection, maintenance of blades and preparation of wooden components for furniture and fabrication projects.                                                                                                                                                                                                                                             |                                               |                                                                                          |
| 28                                    | Wood Lathe                             | 2 Days | 19-Nov-2026 | Introduction to wood turning, lathe components, safety precautions, selection of wood blanks, mounting between centres, speed selection, rough turning and use of turning tools. Spindle turning, taper turning, profile turning, groove cutting, bead formation, measurement of dimensions and correction of machining defects.                                                                                                                                        | Carpentry Shop                                | 1. Dr. Younis Ahmad Dar<br>2. Er. Saba Yaseen<br>3. Er. Murtaza<br>4. Er Mehnan          |
|                                       |                                        |        | 20-Nov-2026 | Sanding, polishing and finishing techniques, preparation of decorative wooden products such as lamp stands, table legs or chess pieces, quality inspection and documentation of finished work.                                                                                                                                                                                                                                                                          |                                               |                                                                                          |

## Skill-oriented activities, Engineering Kitchen

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|---------------------------------------------|--------------------------------------------------|--------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| 29                                          | CNC Router                                       | 3 Days | 30-Nov-2026 | Introduction to CNC routing technology, machine components, safety procedures, CAD model preparation, tool selection, workpiece mounting and machine calibration.<br>CAM software operation, toolpath generation, G-code creation, simulation of machining operations and verification of machining parameters.                                                                           | Carpentry Shop                           | 1. Dr. Mushtaq Ahmad Rgather<br>2. Dr. Ishfaq Amin Makaei<br>3. Er. Saba Yaseen<br>2. Er. Murtaza<br>3. Er Mehnaz |
|                                             |                                                  |        | 1-Dec-2026  | Machine setup, execution of contour cutting, pocket milling, profile machining, engraving operations and monitoring machining accuracy. Fabrication of name plates, furniture components, decorative panels and customized wooden products, inspection of machined features and optimization of machining parameters.                                                                     |                                          |                                                                                                                   |
|                                             |                                                  |        | 2-Dec-2026  | Final project involving complete CAD-CAM-CNC workflow, dimensional inspection, troubleshooting, preventive maintenance and documentation of fabricated products.                                                                                                                                                                                                                          |                                          |                                                                                                                   |
| Smart Agriculture                           |                                                  |        |             |                                                                                                                                                                                                                                                                                                                                                                                           |                                          |                                                                                                                   |
| 4                                           | Plant Growth Chamber                             | 3 Days | 3-Dec-2026  | Introduction to controlled environment agriculture, familiarization with plant growth chamber components, laboratory safety, calibration of temperature, humidity and illumination systems, environmental parameter settings.<br>Seed selection, seed treatment, preparation of growth media, sowing techniques, germination studies, environmental monitoring and observation recording. | Engineering Kitchen-2, Workshop Building | ---                                                                                                               |
|                                             |                                                  |        | 4-Dec-2026  | Climate control, photoperiod programming, hydroponic nutrient preparation, irrigation management, monitoring of plant growth parameters and environmental optimization.<br>Plant growth measurements, stress analysis, nutrient deficiency identification, disease observation, environmental parameter optimization, recording and interpretation of experimental data.                  |                                          |                                                                                                                   |
|                                             |                                                  |        | 7-Dec-2026  | Comparative analysis of plant growth under different environmental conditions, statistical interpretation of results, report preparation, presentation of findings and discussion of applications in smart agriculture.                                                                                                                                                                   |                                          |                                                                                                                   |
| Electronics Manufacturing & PCB Prototyping |                                                  |        |             |                                                                                                                                                                                                                                                                                                                                                                                           |                                          |                                                                                                                   |
| 30                                          | Advanced PCB Fabrication Machine (Voltera V-One) | 5 Days | 7-Dec-2026  | Introduction to PCB fabrication, PCB design concepts, electronic circuit design, schematic preparation, PCB layout, introduction to Gerber files and machine safety.                                                                                                                                                                                                                      | Engineering Kitchen-1, Workshop Building | ---                                                                                                               |
|                                             |                                                  |        | 8-Dec-2026  | PCB layout optimization, Gerber file generation, machine setup, substrate preparation, conductive ink loading, calibration and printing parameter selection.                                                                                                                                                                                                                              |                                          |                                                                                                                   |
|                                             |                                                  |        | 9-Dec-2026  | PCB printing, drilling, inspection of printed tracks, dimensional verification, defect identification and correction of printing errors.                                                                                                                                                                                                                                                  |                                          |                                                                                                                   |
|                                             |                                                  |        | 10-Dec-2026 | Through-hole drilling, soldering of electronic components, continuity testing, electrical inspection and troubleshooting of fabricated PCB.                                                                                                                                                                                                                                               |                                          |                                                                                                                   |
|                                             |                                                  |        | 11-Dec-2026 | Functional testing of fabricated PCB, debugging electronic circuits, quality assurance, documentation and fabrication of a custom PCB for embedded or IoT applications.                                                                                                                                                                                                                   |                                          |                                                                                                                   |
| 31                                          | PCB Stencil Printer                              | 2 Days | 7-Dec-2026  | Introduction to Surface Mount Technology (SMT), stencil printer components, stencil alignment, PCB fixture setup, solder paste selection, application techniques and inspection of solder paste deposition.                                                                                                                                                                               | Engineering Kitchen-1, Workshop Building | ---                                                                                                               |
|                                             |                                                  |        | 8-Dec-2026  | Optimization of stencil printing parameters, identification of printing defects, solder paste quality inspection, cleaning procedures, quality control and preparation of production-ready SMT PCBs.                                                                                                                                                                                      |                                          |                                                                                                                   |
| 32                                          | Pick-and-Place Machine with Reflow Oven          | 5 Days | 9-Dec-2026  | Introduction to SMT assembly, machine components, feeder loading, identification of SMD components, PCB alignment, machine calibration and safety precautions.                                                                                                                                                                                                                            | Engineering Kitchen-1, Workshop Building | ---                                                                                                               |
|                                             |                                                  |        | 10-Dec-2026 | Programming the pick-and-place machine, import of placement files, component library management, automatic component placement and process monitoring.                                                                                                                                                                                                                                    |                                          |                                                                                                                   |
|                                             |                                                  |        | 11-Dec-2026 | Reflow oven operation, temperature profile selection, soldering process optimization, inspection of solder joints and correction of assembly defects.                                                                                                                                                                                                                                     |                                          |                                                                                                                   |
|                                             |                                                  |        | 14-Dec-2026 | Assembly of IoT PCB, LED driver board, sensor interface board or controller PCB, electrical inspection, continuity testing and troubleshooting.                                                                                                                                                                                                                                           |                                          |                                                                                                                   |
|                                             |                                                  |        | 15-Dec-2026 | Functional testing of assembled PCB, debugging hardware faults, quality assurance, documentation and demonstration of completed electronic assembly project.                                                                                                                                                                                                                              |                                          |                                                                                                                   |
|                                             |                                                  |        | 16-Dec-2026 | Introduction to soldering tools, ESD protection, soldering safety, temperature control, through-hole soldering techniques, component identification and solder joint inspection.                                                                                                                                                                                                          |                                          |                                                                                                                   |

Skill-oriented activities, Engineering Kitchen

|    |                            |        |             |                                                                                                                                                                                                                |                                          |     |
|----|----------------------------|--------|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|-----|
| 33 | Digital Soldering Stations | 3 Days | 17-Dec-2026 | Surface Mount Device (SMD) soldering, desoldering techniques, IC replacement, PCB track repair, flux application, use of solder wick and hot-air rework techniques.                                            | Engineering Kitchen-1, Workshop Building | --- |
|    |                            |        | 18-Dec-2026 | Assembly of electronic circuits, troubleshooting faulty PCBs, continuity and functional testing, repair of defective electronic boards, quality inspection and documentation of completed electronic projects. |                                          |     |