

**Laboratories & Lab Work**

Number of Total Engineering and Non-Engineering Courses:	45
Number of Lab Courses:	28
Number of Laboratories:	16

Sr. No	Name of Laboratory (Staff Names-Qualification)	Lab(s) of Course(s) Conducted in the Lab.	Type(s) of Workstations (No. of each type)	Nature of Experiments	No. of Students per Workstation
1	1)Engineering Statics & Dynamics Dr. Rizwan Ahmad Malik (Lab In charge) 2) Engr. Hafiz Muhammad Saleem ( Lab supervisor) 3) Engr. Hafiz Muhammad Saleem (Lab attendant)	1.Engineering Statics 2. Engineering Dynamics.	1. Smooth Inclined Plane apparatus 2. Screw Jack apparatus 3. Angular Momentum Conversion apparatus 4. Fly Wheel Apparatus 5. Worm & Worm Wheel Apparatus 6. Weston Differential Pulley 7. Linear & Angular Speed Apparatus 8. Derrick Crane 9. Coplanar Concurrent Forces Apparatus 10. Cord & Drum Apparatus 11. Polygon of Forces Apparatus 12. Laws of Friction Apparatus 13. Tension in a Hanging Rope. 14. 15.Hook's Law Apparatus 15. Reactions on beam apparatus 16. Centrifugal force apparatus (EES-ST-27) 17. 18.Principle of moment apparatus 18. Force triangle apparatus	Demonstration / Hands-on performance	6 to 7

2	<p><b>Thermodynamics</b></p> <ol style="list-style-type: none"> <li>1. Dr. M Sajjad Sabir Malik (Lab In charge)</li> <li>2. Mr. M. Tariq Ayaz (Lab Supervisor)</li> <li>3. Mr. M. Siddique (Lab Assistant)</li> </ol>	<ol style="list-style-type: none"> <li>1-Thermodynamics-I</li> <li>2- Thermodynamics - II</li> </ol>	<ol style="list-style-type: none"> <li>1. Nozzle Performance Study Apparatus (Model: HM 260 / Gunt Germany)</li> <li>2. Air Compressor Study Unit (Model: WT-01/SOLTEQ Malaysia)</li> <li>3. Thermoelectric Heat Engine (Model: P5687/CUSSONS/Eng.)</li> <li>4. Slow Speed Diesel Engine (Model: PECO/PK)</li> <li>5. Car Sectioned Model (Model: SEADA/1100/England)</li> <li>6. Marcet Boiler (Model: P5700/CUSSONS/England)</li> <li>7. Dead Weight Pressure Gauge Calibrator (Model: Student Project)</li> <li>8. 2 Stroke Petrol Engine Model (Model: KNECO Scientific Japan)</li> <li>9. 4 Stroke Petrol Engine Model (Model: KNECO Scientific Japan)</li> <li>10. 4 Stroke Diesel Engine Model (Model: KNECO Scientific Japan)</li> <li>11. Yamaha Sectioned Engine Model</li> <li>12. Steam Engine Model (Model: KNECO Scientific Japan)</li> <li>13. Steam test Bench (Model: P3740/101/CUSSONS/England) *</li> <li>14. Stirling Cycle Hot Air Engine (Model: P5691/CUSSONS/Eng.)</li> <li>15. Pressure Measurement provided by GUNT</li> <li>16. Steam turbine model</li> <li>17. Wankel Engine model</li> <li>18. Axial flow Air compressor by Electrical Engineering Services</li> </ol>	<p>Demonstration / Hands-on</p>	6 to 7
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3	<b>Drawing Hall</b> 1. Engr. Aneela Anum (Lab In charge) 2. Umer Khalid	1- Engineering Drawing & Graphics	1. Working Tables (60)	Demonstration /Manual drawing	1 per table

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4	<b>Mechanics of Materials</b> 1. Dr. Muhammad Imran (Lab In charge) 2. Engr. Hafiz Muhammad Saleem (Lab Attendant)	1. Mechanics of Materials - I 2. Mechanics of Materials - II	1. Rubber Slab Apparatus 2. Study of spring 3. Twist and Bend Test Machine (MT-210) 4. Fatigue Test Machine (MT-205) 5. Beam Deflection Apparatus 6. Universal Testing Machine (SM-100) * 7. Creep Measurement Apparatus (SM-107) 8. Compound Shaft Apparatus 9. Apparatus for investigating Hook's Law 10. Shear Force and Bending Moment apparatus 11. Eccentrically Loading Ties Apparatus 12. Extension and Compression of Spring Apparatus (Packed) 13. Curved bar app 14. Strut buckling app 15. Thin cylinder app 16. Thick cylinder app 17. Impact tester	Demonstration / Hands-on	6 to 7

5	<p><b>Fluid Mechanics /Fluid structure interaction Lab</b></p> <ol style="list-style-type: none"> <li>1. Dr. M. Shehryar (Lab In charge)</li> <li>2. Engr. Abdul Rehman (Lab Engineer)</li> <li>3. Mehran Gulzar (Lab Attendant)</li> </ol>	<ol style="list-style-type: none"> <li>1- Fluid Mechanics-I</li> <li>2-Fluid Mechanics - II</li> </ol>	<ol style="list-style-type: none"> <li>1. Compressible Flow Bench (Model: Arm field Tech. Edu.)</li> <li>2. Depth of Center of Pressure (Model: Student Project)</li> <li>3. Meta Centric Height (Model: HM 150.06)</li> <li>4. Bernoulli's Principle Apparatus (Model: HM 150.07)</li> <li>5. Series/Parallel Operation of Twin Centrifugal Pump (Model:150.16/Gunt)</li> <li>6. Francis Turbine (Model: HM 150.20/Gunt)</li> <li>7. Pelton Turbine (Model: HM 150.19/Gunt)</li> <li>8. Impulse Turbine with Data Acquisition System (Model: HM 291 / Gunt) *</li> <li>9. Reaction Turbine with Data Acquisition system</li> <li>10. Acquisition System (Model: HM 288 / Gunt) *</li> <li>11. Turbine Service Unit (Model: HM 290/Gunt) *</li> <li>12. Basic Hydraulic Bench (Model: HM 150/Gunt)</li> <li>13. Hydraulic Coefficient in flow through orifices</li> <li>14. Flow Visualization (Model: F14.MK2-A Arm field)</li> <li>15. Free/Forced Vortex (Model: HM 150.14/Gunt)</li> </ol>	<p>Demonstration / Hands-on</p>	6 to 7
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6	<p><b>Mechanics of Machines /Mechanical Vibration</b></p> <ol style="list-style-type: none"> <li>1. Engr. Rana Attaur Rehman (Lab In charge)</li> <li>2. Engr. Hafiz. M. Habib (Lab Engineer)</li> <li>3. Mr. Abdul Hameed (Lab Assistant)</li> </ol>	<ol style="list-style-type: none"> <li>1. Mechanics of Machines - I</li> <li>2. Mechanics of Machines - II</li> </ol>	<ol style="list-style-type: none"> <li>1. Hook's coupling apparatus</li> <li>2. Fly Wheel Apparatus</li> <li>3. Worm and Worm wheel apparatus</li> <li>4. Screw Jack App</li> <li>5. Compound Wheel &amp; Axle 4023</li> <li>6. Machine efficiency apparatus</li> <li>7. Thread Efficiency Apparatus</li> <li>8. Belt Friction Tester</li> <li>9. Clutch Plate Apparatus</li> <li>10. Governor Apparatus</li> <li>11. Flywheel apparatus</li> <li>12. Static Dynamic Balancing Apparatus TM-103</li> <li>13. Ackermann Steering, Demonstrator Apparatus</li> <li>14. Cam and following Mechanism Apparatus</li> <li>15. Belt Friction Apparatus</li> <li>16. Winch Model Apparatus</li> <li>17. Motorized Gyroscope</li> <li>18. Mechanical vibration apparatus</li> </ol>	<p>Demonstration / Hands-on</p>	6 to 7
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7	<b>CAD-I/Modelling &amp; Simulation</b> 1. Dr. Abid Hussain (Lab In charge) 2. Engr. Rehan Saghir (Lab. Engineer) 3. Mr. Kamran Safdar (J. Programmer) 4. Mr. M. Shakeel (Lab Attendant)	1- Finite Element Methods (ANSYS) 2- CAD/CAM (AUTOCAD) 3- Machine Design (CREO)	1. 11 Computers, Core i5 PC's 2. 38 Computer Core i7 3. 01 office computer core i5 4. 01 Laser HP Printer	Demonstration and performance on computers	1 Students per 1PC
8	<b>Refrigeration &amp; Air Conditioning - Heat and mass Transfer</b> 1. Dr. Abid Hussain (Lab In charge) 2. Engr. Sallah ud din (Lab Engineer) 3. Mr. Manzoor Ahmed (Lab Assistant)	1- Refrigeration & Air Conditioning 2- Heat & Mass Transfer	1. Refrigeration Fault Finding Simulator Apparatus 2. Reverse Cycle Air Condition unit provided by Labtech 3. Automotive air conditioning unit provided by P.A Hilton 4. Water Cooling Tower provided by Electrical Engineering services 5. Refrigeration absorption system provided by GUNT 6. Steam jet refrigeration system provided by Electrical Engineering services 7. Radiation heat transfer apparatus provided by Armfield 8. Convection heat transfer apparatus provided by Armfield 9. Conduction heat transfer apparatus provided by Armfield 10. Thermal conducting of fluids apparatus provided GUNT	Demonstration / Hands-on	6 to 7



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			11. Thermal conducting of Building material apparatus provided by Solteq 12. Heat exchanger provided by Solteq		

9	<b>Fracture Mechanics &amp; Fatigue</b> 1. Dr. Azhar Hussain (Lab In charge) 2. Mr. Qaiser Mehmood (Lab Supervisor) 3. Mr. Asad Maqsood (Lab Attendant) 4. Mehdi Hasan	1- Engineering Materials 2- Stress Analysis	1. M.T.S (Material Test System) (Model: 810/USA) (Under maintenance) 2. Pure Bending Testing Machine (Model: PQ-6/China) 3. Electric Discharge Machine (Model: M-50/Thailand) 4. Wire Cut Machine (Model: DK 7740/China) 5. Cooled Incubator (Model: Vt9620/PCSIR) 6. Vertical Universal Friction and Wear Testing Machine (Model: MM-WIA/Time Group Inc. China) 7. Optical Hardness Tester (Model: HBRUV-187.5) 8. Gas Welding (Model: H315FC) 9. Electric Furnace (Model: HF3/VECST-UK) 10. Impact Testing Machine 11. Hydraulic Test (Model: PVM022BIUBI SAY/China) 12. Strain Gauge Calibration (Model: 196797(FL-102) Gunt Hamburg/Germany) 13. Polariscope (Model: 196795 (FL-200) Gunt/Germany) 14. Creep Measurement Apparatus (Model: SM 106/TQ England) 15. X-Y Recorder (Model: DAS 1200/Sefram Instruments & System/France) 16. Buffing Machine (Model: BUFF215-200/PK) 17. Tube furnace (Material Department) 18. Centrifuge Machine 19. Magnetic stirrer hot plate 20. Pin on disc wear test RIG 21. Physical vapor deposition 22. Tribo-tester 23. Sonicator 24. Stress analysis Apparatus 25. Extensometer	Demonstration / Hands-on	6 to 7
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10	<b>CAD-II Lab</b> 1. Dr. Abid Hussain (Lab In charge) 2. Engr. Rizwan Saeed (Lab Supervisor) 3. Mr. M. Zahoor (Lab Assistant)	1. Machine Design & CAD-I 2. Computer System & Programming	1. PCs with Engineering Software (Auto CAD, Code block etc.) 2. 16 Core i5	Demonstration and hands on experience	1 per PC
11	<b>Composite Materials &amp; Smart Structures</b> 1. Dr. M. Ali Nasir (Lab In charge) 2. Mr. M. Umaish (Lab supervisor) 3. Mr. M. Abid (Lab attendant)	Engineering Materials	1. Thermal cycling chamber 2. Oven for curing measurement 3. Vacuum Pump 4. Hot plate magnetic stirrer 5. Weight balance Shimadzu 6. Electronic compact scale 7. Wireless multifunction DAQ Bundle with Android based Tablet 8. Ultrasonic dispenser 9. DMO-412 Centrifuge Machine 10. Rotary Evaporator 11. VARTM Mold for composites 12. Compression mold for composite materials 13. Sheet cutter 14. Vacuum bagging apparatus 15. Dryer 16. Infrared thermometer 17. Negative temperature thermometer	Post Graduate Research	3 to 4

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			18. UNI-T Regulated power supply 19. Hand layup technique for composites		
12	<b>Advance Imaging &amp; Microscopy Development</b> 1. Dr. Muhammad Ali Nasir (Lab in charge) 2. Engr. Zaheer Abbas (Lab Engineer) 3. Mehdi Hasan		1. Scanning Electron Microscope 2. Optical Microscope 3. Metallurgical microscope 4. Zoom microscope 5. Boroscope 6. High Speed Camera (Model: i-speed 2/Olympus) 7. Sputter coater 8. Grinding and Polishing apparatus 9. Mega Pixel Camera	Demonstration / Hands-on /Research	5 to 6
13	<b>Instrumentation &amp; Control Lab</b> 1. Dr. Waqar Ahmed (Lab In charge) 2. Mr. M. Umaish (Supervisor) 3. Mr. Umer Khalid (Lab attendant)	1. Control Engineering 2. Precision Engineering and Metrology	1. Vernier Caliper 2. Micrometer screw gauge 3. Vernier height Gauge 4. Depth gauge 5. Combination set 6. Gauge Block 7. Temperature measurement bench 8. Critical speed investigator 9. Motorized Gyroscope Apparatus 10. FL100 Strain measurement System 11. FL101 Strain Calibration system 12. Impedance Analyzer 13. Transducer and Instrument Trainer	Demonstration /Hands-on	5 to 6

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			14. Twin Rotor MIMO System 15. NI DAQ 16. Digital Storage Oscilloscope		
14	<b>Fluid Structure Interaction (FSI) Lab</b> 1. Dr. M. Shehryar (Lab In charge) 2. Engr. Abdul Rehman (Lab Engineer) 3. Mehran Gulzar	Gas Dynamics	1. Subsonic wind Tunnel 2. Supersonic Wind Tunnel	Demonstration	5 to 6
15	<b>I.C Engine and Power Plant Lab</b> 1. Engr Abdul Mubeen (Lab In charge) 2. Engr. Syed M. Kashif (Lab Engineer) 3. Arshad Mehmood	1. I.C Engine 2. Power Plant	1. Steam Motor Ser 2. Rankine cyclor 3. 2 shaft gas turbines 4. Single cylinder steam engine (under maintenance) 5. Engine test bed (Model: TH03) 6. Exhaust Gas calorimeter (Model: TH21) 7. Different components of I.C engines 8. Slow speed diesel engine	Demonstration / Hands-on	5 to 6

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16	<b>Machine Tools Lab</b> 1. Dr. Waqas Asghar (Lab In charge) 2. Mr. M. Irfan/Mr. Asad Maqsood (Lab Supervisor) 3. Zeeshan Ali	Workshop Practice Manufacturing Processes	1. Center Lathe (CL-305) 2. Bench Lathe (BL-115) 3. Turret Lathe (TL-25) 4. EMCO Lathe 5. Universal Milling Machine (Column Knee Type) 6. Tool Grinder 7. Cylindrical Grinder MIC (1311) 8. Surface Grinding Machine (540) 9. Shaper Machine SH-460 10. Upright Drill Press UD-50 11. Pedestal Drill Press PD-20 12. Power Hacksaw Machine 13. Universal Milling & Drilling machine 14. Multipurpose milling machine	Demonstration / Hands-on	3 to 4
17	<b>Workshop (Shared)</b>	Workshop Practice	1. Fitting Shop 2. Carpentry Shop 3. Electric Shop 4. Machine Shop 5. Symmetry Shop	Demonstration / Hands-on	2 to 3