

## AERODYNAMICS LAB

Sr. No	Apparatus/Equipment required	Specifications	Qty
1	Wind Tunnel with computer Interface	<p><b>Type of Tunnel:</b> Low speed, Open Circuit, Suction Type (Subsonic)</p> <p><b>Test section:</b> 600x600x1200mm</p> <p><b>Air velocity:</b> More than 40m/s</p> <p><b>Drive:</b> Variable Speed AC Motor (sufficient to meet Air velocity) with controller</p> <p><b>Flow quality:</b></p> <ul style="list-style-type: none"> <li>• Turbulence intensity should be less than 5%</li> <li>• Flow variation in the test section should be less than 5% at a given cross section for all velocities.</li> </ul> <p>Multi-tube Manometer(50 tube)</p> <p><b>MEASUREMENT OF FLOW VELOCITY (For MANUAL OPERATION).</b></p> <ol style="list-style-type: none"> <li>1. Pitot Static tube: <b>04 Units</b></li> <li>2. 5 hole for flow direction measurement experiments. <ul style="list-style-type: none"> <li>• The pitot static tube and 5 hole pitot should be installed at the end of test section, with dual Limb Manometer.</li> <li>• PITOT tube is installed at the end of working section so as to avoid flow disturbance in the test section if installed before working section.</li> </ul> </li> <li>3. PRESSURE TRANSDUCER <ul style="list-style-type: none"> <li>• Units required: 02</li> <li>• (+/- 1 bar ) with DATA ACQUISITION CARD and software interface for acquiring and processing the data using computer.</li> <li>• <b>Specifications of data acquisition system:</b></li> <li>• 8 AI Channels with sampling rate of 20KS/s or better</li> <li>• ADC resolution 14 bit or better</li> <li>• Bandwidth 300 kHz</li> <li>• Compatibility with transducer to acquire data with software using computer.</li> </ul> </li> </ol>	01 unit

*Shiva*  
28/7/21

*Chandray*

*BK Divedi*  
24/07/2021

*Sumit* *Aruna*

*Pang*

		<ul style="list-style-type: none"> <li>• Specification of software:</li> <li>• Should be compatible with provided DAQ</li> <li>• Capable to acquire, save and reproduce the data in form of pressure and velocity in SI units</li> </ul> <p><b>4. Computer</b></p> <ul style="list-style-type: none"> <li>• Computer from a Branded Company</li> <li>• Required to acquire data using software from DAQ connected to pressure transducer with i5 Processor.</li> <li>• RAM: 8 GB or more</li> <li>• HARD DRIVE: 1 TB</li> <li>• OS: Windows (latest)</li> <li>• USB 3.0 ports</li> <li>• Monitor of LED 21" and related Cables and accessories.</li> </ul> <p><b>5. Different type of airfoils</b></p> <ul style="list-style-type: none"> <li>• Symmetrical (NACA0012)</li> <li>• Cambered with flap (NACA2412)</li> <li>• Cylinder</li> <li>• Rotating cylinder</li> <li>• Flat plate</li> </ul> <p>With pressure ports on both sides of Airfoils (minimum 24). The ports should be number marked and should be provided with tube at outlet which again should be number matched the connected.</p> <p>All the models should be such that blockage in wind tunnel should be less than 10% in the worst case scenario.</p> <p>The test section should have arrangement to install the models and run the tunnel.</p> <p><b>6. General requirements:</b></p> <ol style="list-style-type: none"> <li>1. The installed wind tunnel should be such a convenient eye level height; this may require table or other such stands to adjust the height of tunnel.</li> <li>2. Required accessories such a data cables of required length, power cables must be provided</li> <li>3. Required warranty of 3 years or more.</li> <li>4. Compatibility condition: All components, data acquisition system and software should be compatible with each other since they are intended to be used in the same wind tunnel.</li> </ol> <p><b>Note: 3 Year warranty of various parts and 5 years AMC</b></p>	
--	--	---	--

*28/7/21*

*Chandrashekar*

*PKAivedi  
24/07/2021*

*1 month Aravind Singh*

2	Smoke Tunnel	<p><b>Subsonic Open Type</b> Size: 1500 X 1500 X 50 mm.</p> <p><b>WORKING SECTION</b> At front and back, Easily removable.</p> <p><b>FLOW STRAIGHTNER</b> <b>HONEYCOMB STRUCTURE</b> Material: Aluminum</p> <p><b>AXIAL FAN</b> Suction type with compatible capacity.</p> <p><b>SMOKE GENERATOR</b> For Flow visualization using propylene glycol. With light source With provision to change angle of attack</p> <p><b>ACCESORIES</b></p> <ul style="list-style-type: none"> <li>• Sphere shaped model.</li> <li>• Cylindrical shaped model.</li> <li>• Clark y (aero foil shape)</li> </ul>	01
3	Hele-Shaw Apparatus	<p><b>Working Section:</b> Made of two laminated glass / acrylic sheets which are closely spaced and fixed in a leak proof moulding</p> <p><b>Flow table :</b> Width = minimum 300mm, Length = minimum 500mm,</p> <p><b>Dye Tank With Flow Control:</b> Stainless steel tank with minimum 1L capacity Dye injection facility.</p> <p><b>Obstacles :</b> Different shapes such as Cylinder, Aerofoils (Cambered &amp; Symmetrical), Delta Wing etc.</p>	01

*Jtiwana*  
28/7/21

(Prof. J.S. Tiwana)

*Tushar Siag*

(Er. Tushar Siag)

*BK Dwivedi*  
24/07/2021

(Dr. Bipin Dwivedi)

*Samir* *Ashwini* *Pang*