



**DEENBANDHU CHHOTU RAM UNIVERSITY OF SCIENCE & TECHNOLOGY, MURTHAL,  
SONEPAT, HARYANA-131039**

**APPARATUS REQUIRED FOR B. Tech. in Aeronautical Engineering (4 Years)**

|   | <b>INFRASTRUCTURE</b>   | <b>REQUIRED</b> | <b>AVAILABLE</b> | <b>DEFICIENCY</b> |
|---|---|-----------------|------------------|-------------------|
| <b>List of Labs / Equipments</b>  |   |                 |                  |                   |
| <b>Sr. No.</b>  | <b>Name of Equipments</b>   | <b>Quantity</b> |                  |                   |
| <b>2<sup>nd</sup> Year Labs: Introduction to Aerodynamics Lab, Strength of Materials-I Lab, Fluid Mechanics Lab, Manufacturing Practice</b> |   |                 |                  |                   |
| <b>AER 203B Introduction to Aerodynamics Lab</b>  |   |                 |                  |                   |
| 1   | Trainer Aircraft  | 01              |                  |                   |
| 2   | Turbojet Engine Model   | 01              |                  |                   |
| 3   | Turboprop Engine Model  | 01              |                  |                   |
| 4   | Turbofan Engine Model   | 01              |                  |                   |
| 5   | Semimonocoque Structure (Exploded Assembly)                         | 01              |                  |                   |
| <b>ME 211B Strength of Materials-I Lab (Common with ME)</b>   |   |                 |                  |                   |
| 1   | Brinell Hardness Tester   | 01              |                  |                   |
| 2   | Rockwell Hardness Tester  | 01              |                  |                   |
| 3   | Vickers Hardness Tester   | 01              |                  |                   |
| 4   | Erichsen Sheet Metal / Cupping Tester                               | 01              |                  |                   |
| 5   | Izod Impact Tester  | 01              |                  |                   |
| 6   | Charpy Impact Tester  | 01              |                  |                   |
| 7   | Universal Testing M/C   | 01              |                  |                   |
| 8   | Torsion Testing M/C   | 01              |                  |                   |
| 9   | Fly Wheel to find out Moment of Inertia                             | 01              |                  |                   |
| <b>ME 215B Fluid Mechanics Lab (Common with ME)</b>   |   |                 |                  |                   |
| 1   | Impact of Jet Apparatus   | 01              |                  |                   |
| 2   | Orifice meter Apparatus   | 01              |                  |                   |
| 3   | Notch Apparatus   | 01              |                  |                   |
| 4   | Friction Factor Apparatus   | 01              |                  |                   |
| 5   | Venturimeter Apparatus  | 01              |                  |                   |
| 6   | Orifice Test Rig  | 01              |                  |                   |
| 7   | Bernoulli's Theorem Apparatus                                       | 01              |                  |                   |
| 8   | Reynolds Apparatus  | 01              |                  |                   |
| 9   | Metacentric Height Apparatus  | 01              |                  |                   |
| 10  | Minor Losses Test Rig   | 01              |                  |                   |
| 11  | Forced Vortex Flow Apparatus  | 01              |                  |                   |
| <b>ME 218B Manufacturing Practice (Common with ME)</b>  |   |                 |                  |                   |
| 1   | Pattern Making & Foundry Shop with all tools & Equipments           | 01 Set          |                  |                   |
| 2   | Welding M/C and related tools & Equipments                          | 02 Sets         |                  |                   |
| 3   | Grinding Machine and measurements tools                             | 02 Sets         |                  |                   |
| 4   | Lathe Machine   | 05 Set          |                  |                   |
| 5   | Sample of components to measure tolerance in shaft, brush, key etc. | 01 Set          |                  |                   |
| 6   | Tail stock, Bench Vice, Screw Jack for assembly                     | 01 Set each     |                  |                   |
| 7   | Sheet Metal Shop with tools and equipments                          | 01 Set          |                  |                   |
| 8   | Milling Machine with indexing device                                | 02 Set          |                  |                   |
| 9   | Drilling Machine with tools   | 05 Set          |                  |                   |
| 10  | CAD / CAE Software  | 20 User license |                  |                   |
| <b>AER 212B Aircraft Instrumentation Lab</b>  |   |                 |                  |                   |
| 1   | VTVM digital voltmeter  | 01              |                  |                   |
| 2   | D.C. Genrator   | 01              |                  |                   |
| 3   | Ammeter, Voltmeter  | 01              |                  |                   |
| 4   | Wattmeter   | 01              |                  |                   |
| 5   | Cathod Ray Oscilloscope   | 01              |                  |                   |
| 6   | Working Model of Starter  | 01              |                  |                   |
| 7   | Power Measuring Instruments   | 01              |                  |                   |
| 8   | Working Model of Rectifier  | 01              |                  |                   |
| 9   | Charging and Discharging System of Battery                          | 01              |                  |                   |

**3<sup>rd</sup> Year Labs: Aerodynamics Lab, Aircraft Structure Lab, Internal Combustion Engines Lab, Aircraft Propulsion Lab, Heat Transfer Lab**
**AER 311B Aerodynamics Lab**

| Sr.No. | Description             | REQUIRED | AVAILABLE | DEFICIENCY |
|--------|-------------------------|----------|-----------|------------|
| 1      | Anemometer Apparatus    | 01       |           |            |
| 2      | 2-D cylinder            | 01       |           |            |
| 3      | Aerofoil object         | 03       |           |            |
| 4      | Heleshaw flow apparatus | 01       |           |            |
| 5      | Wind tunnel apparatus   | 01       |           |            |

**AER 313B Aircraft Structure Lab**

|   |   |    |  |  |
|---|---|----|--|--|
| 1 | One trainer aircraft with its details structure to study experiments listed from 1 to 5 | 01 |  |  |
| 2 | Strain gauge apparatus  | 01 |  |  |
| 3 | Surface crack detection apparatus   | 01 |  |  |
| 4 | Truss apparatus   | 01 |  |  |
| 5 | Simply supported beam apparatus   | 01 |  |  |
| 6 | Thin plate apparatus  | 01 |  |  |

**ME 315B Internal Combustion Engines Lab (Common with ME)**

|    |   |         |  |  |
|----|---|---------|--|--|
| 1  | Working models of 2-stroke & 4-stroke Petrol Engine | 01 each |  |  |
| 2  | Working models of 2-stroke & 4-stroke Diesel Engine | 01 each |  |  |
| 3  | Orsat Apparatus                                     | 01      |  |  |
| 4  | Multi-Cylinder Diesel Engine Test Rig               | 01      |  |  |
| 5  | Multi-Cylinder Petrol Engine Test Rig               | 01      |  |  |
| 6  | Single-Cylinder Diesel Engine Test Rig              | 01      |  |  |
| 7  | Single-Cylinder Petrol Engine Test Rig              | 01      |  |  |
| 8  | Two Stroke, Single-Cylinder Petrol Engine Test Rig  | 01      |  |  |
| 9  | Exhaust Gas Analyser                                | 01      |  |  |
| 10 | Smokemeter  | 01      |  |  |

**AER 310B Aircraft Propulsion Lab**

|   |                                  |    |  |  |
|---|----------------------------------|----|--|--|
| 1 | Axial flow compressor apparatus  | 01 |  |  |
| 2 | Centrifugal compressor apparatus | 01 |  |  |
| 3 | Gear box apparatus               | 01 |  |  |
| 4 | Main fuel pump apparatus         | 01 |  |  |
| 5 | Combustion chamber apparatus     | 01 |  |  |
| 6 | After burning system apparatus   | 01 |  |  |
| 7 | complete Piston engines          | 01 |  |  |
| 8 | Complete jet engine              | 01 |  |  |
| 9 | Propellers apparatus             | 01 |  |  |

**ME 316B Heat Transfer Lab (Common with ME)**

|     |   |    |  |  |
|-----|---|----|--|--|
| 1.  | Thermal Conductivity of Metal Bar Apparatus           | 01 |  |  |
| 2.  | Thermal Conductivity of Insulating Powder Apparatus   | 01 |  |  |
| 3.  | Thermal Conductivity of Liquid Apparatus              | 01 |  |  |
| 4.  | Pin. Fin Apparatus . Natural Convection               | 01 |  |  |
| 5.  | Pin. Fin Apparatus . Forced Convection                | 01 |  |  |
| 6.  | Natural Convection Apparatus                          | 01 |  |  |
| 7.  | Forced Convection Apparatus                           | 01 |  |  |
| 8.  | Emissivity Apparatus                                  | 01 |  |  |
| 9.  | Parallel Flow & Counter Flow Heat Exchanger Test Rig. | 01 |  |  |
| 10. | Stefan Boltzmann Apparatus                            | 01 |  |  |
| 11. | Heat Pipe Demonstrator Test Rig                       | 01 |  |  |
| 12. | Two Phase Heat Transfer Test Rig                      | 01 |  |  |
| 13. | Cross Flow Heat Exchanger Test Rig                    | 01 |  |  |

**4<sup>th</sup> Year Labs: Computational Lab, R.A.C. Lab**
**AER-405B Computational Lab**

|  |   |    |  |
|--|---|----|--|
| 1  | 20 personal computers may be loaded with computational Fluid Dynamics software like ANSYS Workbench/FLUENT, COMSOL Multiphysics, HYDRA, FLASH, OpenFOAM to perform the practical listed in the syllabus |    |  |
| <b>ME 411B Ref. &amp; Air Conditioning Lab (Common with Mech. Engg.)</b> |   |    |  |
| 1.   | Vapour Compression Refrigeration System Test Rig  | 01 |  |
| 2.   | Mechanical Heat Pump Test Rig   | 01 |  |
| 3.   | Air & Water Heat Pump Test Rig  | 01 |  |
| 4.   | Ice . Plant Test Rig  | 01 |  |
| 5.   | Air conditioning Test Rig   | 01 |  |
| 6.   | Recirculated Air conditioning Test Rig  | 01 |  |
| 7.   | Cut-Sectional Model of Reciprocating Compressor   | 01 |  |
| 8.   | Cut-Sectional Model of Rotary Compressor  | 01 |  |
| 9.   | Cut-Sectional Model of Chilling Plant   | 01 |  |
| 10.  | Various controls used in Refrigerating System   | 01 |  |
| 11.  | Various controls used in Air . Conditioning System  | 01 |  |