

List of Experiments

1	Strength Of Materials Lab
	<ul style="list-style-type: none"> • Izod Impact testing. • Rockwell Hardness Testing. • Spring Testing • Column Testing for buckling • Torsion Testing • Tensile Testing • Compression Testing • Shear Testing • Brinell Hardness Testing • Bending Test on UTM. • Study of Fatigue Testing Machine.
2	Thermodynamics Laboratory
	<ul style="list-style-type: none"> • Performance test on a 4-stroke engine • Valve timing of a 4 – stroke engine and port timing of a 2 stroke engine • Determination of effectiveness of a parallel flow heat exchanger • Determination of effectiveness of a counter flow heat exchanger • Determination of the viscosity coefficient of a given liquid • COP test on a vapour compression refrigeration test rig • COP test on a vapour compression air-conditioning test rig • Study of a Gas Turbine Engine. • Determination of Conductive Heat Transfer Coefficient. • Determination of Thermal Resistance of a Composite wall.
3.	Fluid Mechanics And Machinery Laboratory
	<ul style="list-style-type: none"> • Calibration of venturimeter • Pressure measurement with pitot static tube • Determination of pipe flow losses. • Verification of Bernoulli's theorem • Flow visualization by Heleshaw apparatus • Performance test on centrifugal pumps • Performance test on reciprocating pumps • Performance test on piston wheel turbine • Performance test on Francis turbine • Determination of Viscosity of a Fluid
4	Computer Programming Lab
	<ul style="list-style-type: none"> • Program for revising control statements, arrays and functions. • Program using string handling and various functions described in string.h, ctype.h. • Program using structures and sorting algorithm (Insertion, Selection, Quick, Heap sort) and functions described in math. • Program using file handling and related functions defined in stdio.h, io.h. • Program using pointers, array and pointers, pointers to structures, dynamic memory allocation. • Program using basic I/O and control statements. • Program using class, objects, objects as function parameters. • Program using functions and passing reference to a function, inline functions. Program using Inheritance and virtual base class. • Program using pointers, arrays, dynamic arrays. Program using functions defined in ctype.h and string.h. • Program using constructors, destructors. Program using function and operator over loading • Creating and managing (add, delete, print, insert) nodes of a Linked list. • Creating and managing (create, pop, push etc.) stacks and queues.
5	Aerodynamics Laboratory
	<ul style="list-style-type: none"> • Calibration of subsonic wind tunnel. • Pressure distribution over smooth and rough cylinder.

	<ul style="list-style-type: none"> • Pressure distribution over symmetric airfoils. • Pressure distribution over cambered airfoils & thin airfoils • Force measurement using wind tunnel balance. • Flow over a flat plate at different angles of incidence • Flow visualization studies in low speed flows over cylinders • Flow visualization studies in low speed flows over airfoil with different angle of incidence • Calibration of supersonic wind tunnel. • Supersonic flow visualization with Schlieren system.
6.	Design And Computer Aided Modeling Lab
	<ul style="list-style-type: none"> • Design of riveted joints (Lap joint). • Design of riveted joints (Butt joint with single and double straps). • Design of welded joints. • Layout of typical wing structure. • Layout of typical fuselage structure. • Computer aided modeling of typical aircraft wing. • Computer aided modeling of typical fuselage structure. • Computer aided modeling of landing gear • Three view diagram of a typical aircraft • Layout of control systems
7.	Aircraft Structures Lab –I
	<ul style="list-style-type: none"> • Determination of Young’s modulus of steel using mechanical extensometers. • Determination of Young’s modulus of aluminum using electrical extensometers • Determination of fracture strength and fracture pattern of ductile materials • Determination of fracture strength and fracture pattern of brittle materials • Stress Strain curve for various engineering materials. • Deflection of beams with various end conditions. • Verification of Maxwell’s Reciprocal theorem & principle of superposition • Column – Testing • South – well’s plot. • Riveted Joints.
8.	Control Laboratory
	<ul style="list-style-type: none"> • Block diagram reduction technique • Block diagram formation for Control Systems. • Step Response of 2nd order transfer function • Root Locus Plot • Bode Plot • Laplace & inverse laplace • Polar plot & Nyquist Stability Criterion • Hydraulic System • Convert Transfer function to State Space & Vice Versa • Calculate Observability & Controllability
9.	Aircraft Structures Lab – Ii
	<ul style="list-style-type: none"> • Unsymmetrical bending of beams • Shear centre location for open sections • Shear centre location for closed sections • Constant strength beam • Flexibility matrix for cantilever beam • Beam with combined loading • Calibration of Photo- elastic materials • Stresses in circular discs and beams using photoelastic techniques • Vibrations of beams • Wagner beam – Tension field beam
10.	Aircraft Structures Repair Lab
	<ul style="list-style-type: none"> • Aircraft wood gluing • Welded patch repair by TIG, MIG, PLASMA ARC. • Welded patch repair by MIG

	<ul style="list-style-type: none"> • Welded patch repair by plasma Arc • Fabric Patch repair • Riveted patch repairs. • Repair of composites • Repair of Sandwich panels. • Sheet metal forming. • Control cable inspection and repair.
11.	Cad / Cam Laboratory
	<ul style="list-style-type: none"> • Scaling, rotation, translation, editing, dimensioning – Typical CAD command structure. • Wire frame modeling – surface modeling • Solid Modeling • Taper Turning – Straight Interpolation • Taper Turning – Circular Interpolation • Incremental programme G 90 operation. • Mirroring. • Incremental Programme G 91 operation • Absolute Programme G 90 operation • Absolute Programme G 91 operation
12.	Electronics & Microprocessor Lab
	<ul style="list-style-type: none"> • Plot V-I characteristic of P-N junction diode & calculate cut-in voltage, reverse Saturation current and static & dynamic resistances. • Plot V-I characteristic of zener diode and study of zener diode as voltage regulator. Observe the effect of load changes and determine load limits of the voltage regulator. • Plot frequency response curve for single stage amplifier and to determine gain bandwidth product. • Study all types of rectifier and measure the effect of filter network on D.C. voltage output & ripple factor. • Op-Amp in inverting and non-inverting modes. • Op-Amp as scalar, summer and voltage follower. • Design LPF and HPF using Op-Amp 741 • Design Oscillators using Op-Amp (i) RC phase shift (ii) Hartley (iii) Colpitts • Programme to multiply two 8-bit numbers. • Programme to generate and sum 15 fibanocci numbers. • Transfer of a block of data in memory to another place in memory in the direct and reverse order. • Searching a number in an array and finding its parity.
13.	Propulsion Laboratory
	<ul style="list-style-type: none"> • Study of an aircraft piston engine. (Includes study of assembly of sub systems, various components, their functions and operating principles) • Study of an aircraft jet engine (Includes study of assembly of sub systems, various components, their functions and operating principles) • Study of forced convective heat transfer over a flat plate. • Study of free convective heat transfer over a flat plate • Cascade testing of a model of axial compressor blade row. • Study of performance of a propeller. • Determination of heat of combustion of aviation fuel. • Combustion performance studies in a jet engine combustion chamber. • Study of free jet. • Study of wall jet.
14	Aerodynamics Laboratory
	<ul style="list-style-type: none"> • Fluid flow studies using a blower • Drags of different bodies • Lift of flat and curved plates and wings • Experiments in a small low speed wind tunnel • Pressure distribution studies on two-dimensional models. • Pressure distribution studies in Swept wings.

	<ul style="list-style-type: none"> • 7. Calibration of subsonic wind tunnel
15.	Aero Engine Repair And Maintenance
	<ul style="list-style-type: none"> • Stripping of a piston engine • Engine (Piston Engine) - cleaning, visual inspection, NDT checks. • Piston Engine Components - dimensional checks. • Piston – Engine reassembly. • Propeller Pitch Setting • Stripping of a jet engine • Jet Engine – identification of components & defects. • Jet Engine – NDT checks and dimensional checks • Jet Engine – reassembly. • Engine starting procedures.
16.	Aircraft Design Project – II
	<ul style="list-style-type: none"> • V-n diagram for the design study • Gust and maneuverability envelopes • Critical loading performance and final V-n graph calculation • Structural design study – Theory approach • Load estimation of wings • Load estimation of fuselage. • Balancing and Maneuvering loads on tail plane, Aileron and Rudder loads. • Detailed structural layouts • Design of some components of wings, fuselage • Preparation of a detailed design report with CAD drawings.
17.	Avionics Laboratory
	<ul style="list-style-type: none"> • DIGITAL ELECTRONICS • Addition/Subtraction of binary numbers. • Multiplexer/Demultiplexer Circuits. • Encoder/Decoder Circuits. • Timer Circuits, Shift Registers, Binary Comparator Circuits. • MICROPROCESSORS • Addition and Subtraction of 8-bit and 16-bit numbers. • Sorting of Data in Ascending & Descending order. • Sum of a given series with and without carry. • Greatest in a given series & Multi-byte addition in BCD mode. • Interface programming with 4 digit 7 segment Display & Switches & LED's. • Channel Analog to Digital Converter & Generation of Ramp, Square, Triangular wave by Digital to Analog Converter. • AVIONICS DATA BUSES • Study of Different Avionics Data Buses. • MIL-Std – 1553 Data Buses Configuration with Message transfer. • MIL-Std – 1553 Remote Terminal Configuration.