GOPALAN COLLEGE OF ENGINEERING AND MANAGEMENT
Accredited by NAAC with B+ Grade, An ISO 9001: 2015 Certified Institution
Affiliated to V.T.U., Belagavi, Approved by AICTE, New Delhi.
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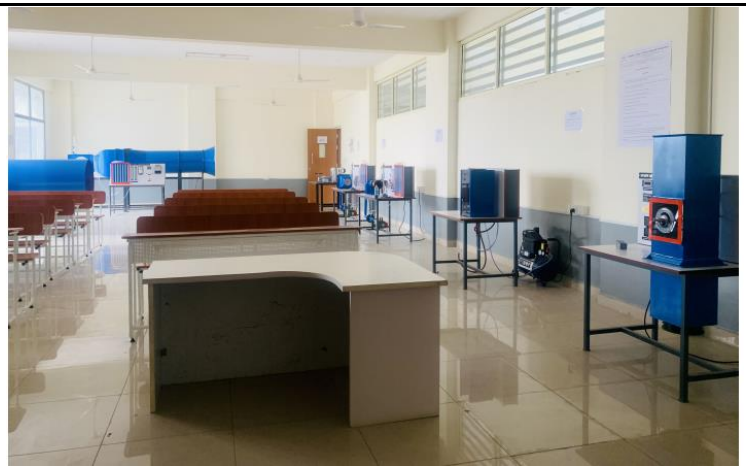
Department of Aeronautical Engineering - Laboratory details

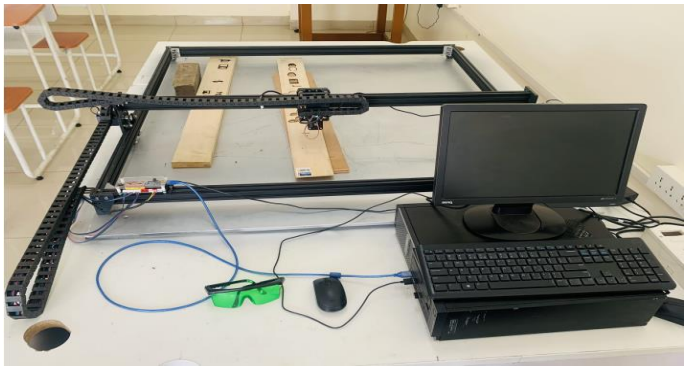
Sl. No	Name of the Laboratory	Photo of the lab	Lab description
1	Computer Aided Aircraft Drawing Flight Modelling, Analysis & Simulation Lab		**CAAD lab** transforms machine drawing knowledge to practical application of designing aircraft components. The students use Solid Edge & FreeCAD software to design, thread forms, Fasteners, Keys & Joints, Couplings. Apart from these basic designs, they will learn to model and assemble Propeller and hub, wing, fuselage, Engine mounts, Main rotor of helicopter, Landing gear and UAV. **Modelling & Analysis Lab** Modelling and Analysis Lab is equipped with 30 high end computing systems with i5 processor and 16GB ram. Basic theoretical principles of Finite Element analysis are applied to solve real-time problems using Ansys & open Foam simulation software. Major analysis includes, Isentropic Flow analysis in a 2D subsonic and supersonic Diffuser and nozzle, Stress analysis of Wing, Fuselage frame and tapered plate. **Flight Simulation Lab** Flight simulation Lab intends to introduce modern tool usage to model aeronautical

			vehicle dynamics and carry out complex analysis using MATLAB and SciLab software related toolbox. The Flight simulation Lab has 30 computers with intel's i5 processor and 16GB ram to help run simulations at a faster rate. A wide variety of experiments can be carried out such as, Straight and level flight simulation, take-off and landing with trajectory tracing, measuring static margin on stalling characteristics, Stability effect derivatives for pulse, doublet input in pitch and speed respectively.
2	Aerodynamics Lab		Computerised Wind tunnel Lab has been set up at the Department of Aeronautical Engineering, to carry out fundamental Aerodynamic experiments at UG & PG levels. The objective of the facility is to enhance academic experimentation and research studies in low Reynolds number Aerofoil Steady flow Aerodynamics, flow control analysis and Symmetric and Cambered aerofoil performance. The students are encouraged to carry out their academic projects on Aerodynamic analysis and experimentation in this lab.

3	Aircraft Structures Lab		Aircraft Structure Lab caters to the academic and research requirement of UG & PG students, research scholars and faculties to carry out their research. Apart from this, the lab has experimental setup to test young's modulus and Poisson's ratio, test setup for verification of Maxwell's theorem and to test shear failure of Bolted and Riveted Joints.
4	Aircraft Propulsion Lab		The Propulsion lab has the following major equipment: Low speed cascade wind tunnel, Propeller test rig, Nozzle flow setup and premixed flame with compressor. Apart from these, the facility holds forced Convective heat transfer setup and bomb calorimeter to study the performance of aviation fuel.

5	Machine Shop		Students are exposed to general purpose & Special purpose machine tools and different methods of manufacturing processes. The lab offers advanced equipment for turning & facing, knurling, drilling, boring, internal & external thread cutting, eccentric turning, shaping, milling and grinding machine. The outcome is that the students demonstrate the operation of general & Special purpose tools, and also can identify the special tools for specific requirements.
6	Energy Conversion & Fluid Mechanics lab		Fluid mechanics study for Aeronautical Engineering plays a vital role in Aeronautical Engineering. Energy Conversion and Fluid mechanics Laboratory is actively engaged to reinforce and enhance understanding of the fundamentals of Fluid mechanics. The experiments here are designed to demonstrate the applications of the basic fluid engineering principles and to provide a more intuitive and physical understanding of the theory. The experimental setup includes, Torsion Viscometer, Venturi meter, rectangular notch, Multi cylinder petrol Engine test rig with eddy current dynamometer with cooling water and 4 stroke single cylinder petrol engine test rig.

			
7	Material Testing Lab		Material testing lab provides the fundamental knowledge of materials and their properties thoroughly using state of the art equipment, that help students to get hands-on experience on different methods of material testing. Major equipment includes, UTM, Study of wear characteristics of ferrous, non-ferrous and composite materials, Magnetic Particle inspection, Vicker's, Brinell and Rockwell hardness test rig, Torsional, Impact, shear and fatigue test rig. Also, the lab has Ultrasonic, Eddy Current Inspection techniques to help students, faculties and research scholars to carry out advanced research in modern tool usage.

8	GRIT Lab A. Aeromodelling Club B. Astronomy Club C. UAV Club	  	**Gopalan Research Innovation and Training Centre (GRIT)** is established to promote innovation and research activities on the campus. It promotes undergraduate research, and innovation as well as provides training on the recent advancements in the different disciplines of engineering to aspiring young college students. G R I T closely works with industries under MOU to address R&D projects of mutual interest. Some of the key experimental facilities in GRIT include special-purpose Energy and Environment lab, Experimental Aero Lab, Design and Computation Lab, Fabrication and Testing, Sensors Lab, Virtual Instrumentation Lab.