



DEPARTMENT OF AERONAUTICAL ENGINEERING

Skill Lab Details

Sec	Particulars	Skill Lab - 1	Skill Lab - 2
a	Name of the Special Skill Lab	Skill Lab – 1: Gopalan Research and Innovation Training Centre (GRIT)	Skill Lab – 2: Additive Manufacturing Centre/Advanced Aerodynamics Test Centre
	Details of Equipment/Facilities	<p>Simulation:</p> <ol style="list-style-type: none">1. Desktop with Microsoft Flight Simulator Software2. Thrust Master Stick X Joystick3. UAV Netra Dummy Model <p>Data Processing:</p> <ol style="list-style-type: none">1. Current to Voltage Converter2. Voltage to Current Converter3. 2” Display Unit4. General Amplifier5. Filter – LP, HP, BP6. 0-5mm LVDT along with Signal Conditioning Unit7. 2 Component – 2 kg Cantilever Type Load Cell along with Signal Conditioner	<p>Additive Manufacturing:</p> <ol style="list-style-type: none">1. 3D Printer2. Laser Cutting Machine3. Hot Wire Foam Cutter <p>Advance Aerodynamics:</p> <ol style="list-style-type: none">1. Mini Wind Tunnel2. Vertical Wind Tunnel3. Wind Blower4. Desktop with Advanced Vibration Setup <ol style="list-style-type: none">1. Sukhoi 30 MKI Static Model2. Library Books

		8. Cantilever Beam with Strain Gauges & Loading arrangement along with Signal Conditioner 9. Accelerometer along with Pre amplifier 10. Multimeter 11. Desktop with LabView Software 13. Thrust Rig 14. Wind Mills 100 W & 500 W Assembly Room: 1. Hot Wire Foam Cutter – no.1 2. Tool Kit 3. Hexacopter and Quadcopter Frames 4. Soldering Kit	
b	Area in Sq Mtr	150 Sqm	75 Sqm
c	Internet Connectivity Speed Exclusively for Skill Lab	100 mbps	100 mbps
	Name of the Person Incharge Mobile Number and E-mail Id	Mr. Rajashekharareddy H G Assistant Professor – AE rajreddyhg@gmail.com +91 7795080570	Mr. Jiniraj Assistant Professor – AE jinirajphd@gmail.com +91 9952458480
d	Name of the Expert or Faculty Identified to Train Students with their Specializations	Mr. Rajashekharareddy H G Assistant Professor – AE Dr. G Ramesh Dean Research – GCEM, Prof – AE Mr. Praveen N	Mr. Jiniraj Assistant Professor – AE Dr. Konda Sirikonada Mallik Assistant Professor – AE Mr. Saviraj A S

		Assistant Professor – AE	Assistant Professor – AE
e	Name of the Industries Connected – MoUs	1. Barola Technologies 2. Captronic Systems Pvt Ltd 3. NAL Tech 4. Gopalan Aerospace India Pvt Ltd 5. Aeronautical Society of India, Bangalore Branch 6. Jetwings Technologies	
h	Contents Taught Within the Syllabus Through Skill Lab	1. Flight dynamics and aircraft performance analysis 2. Aircraft control systems 3. Flight testing and simulation 4. Aerodynamics of UAVs 5. Avionics display systems 6. Instrumentation and data acquisition systems 7. Force and load measurements in aerospace structures 8. Stress analysis and testing 9. Strain measurement and analysis 10. Dynamics and vibration analysis in aerospace systems 11. Engine performance testing and analysis 12. Aircraft maintenance and repair	1. Introduction to additive manufacturing 2. Material properties and selection 3. Precision cutting, engraving, and etching techniques 4. Techniques for shaping and sculpting foam 5. Fundamentals of aerodynamics 6. Wind tunnel operation and safety procedures 7. Aerodynamic measurements and instrumentation 8. Vertical wind tunnel design and operation 9. Body flight techniques and control in wind tunnels 10. Wind load analysis for structures and vehicles 11. Boundary layer studies and turbulence measurement 12. Aerodynamic stability and control experiments 13. Wind tunnel calibration and flow visualization techniques 14. Vibration theory and analysis in engineering systems 15. Instrumentation and measurement techniques for vibration analysis 16. Modal analysis and natural frequency determination

			17. Vibration control and mitigation strategies
i	Contents Taught Beyond the Regular Class Work	<p>1. A Guest Lecture on “Higher Education and Research Opportunities Abroad” by Prof. Igors, Tipans, Deputy Rector, Riga Technical University, Latvia conducted on 15/11/2022.</p> <p>2. A Technical Talk on “Introduction to Rockets & Missiles, ISRO’s ongoing projects and career prospects” by Prof. Elangovan Rajgopalan, Former ISRO Scientist held on 13/12/2022.</p> <p>3. Workshop on “MATLAB for Aeronautical/ Aerospace Applications” by Mr. Praveen N Assistant Professor, GCEM,</p> <p>4. A Technical Talk on “GATE: Preparation and Future Prospects” by Mr. Saviraj A S , Assistant Professor, GCEM held on 14/12/2022.</p> <p>5. GO AERO-2023: National Level Aero Technical-Cultural Fest held on 10-4-2023 & 11-4-2023.</p> <p>6. Institutional Internship Program in CATIA, SOLID WORKS, XFLR5, JAVA FOIL, QBLADE, ANSYS FLUENT & MATLAB by Mr. Jiniraj, Dr. Kondamallik, Mr. Praveen conducted on 17-5-2023 to 3-6-2023.</p>	<p>1. A workshop on “Indigenous Development of Unmanned Aerial Vehicle (UAV)” by Mr. Prashanth Radhakrishnan, CEO & Founder, Dautya Aerospace Pvt. Ltd., Goa & Bengaluru conducted on 15/10/2022.</p> <p>2. Workshop on “CATIA: Sketching, Part Design and Assembly” by Mr. Rajashekharreddy H G, Assistant Professor, GCEM.</p> <p>3. An online competition on “Aircraft Sketching” for Pre-University students conducted on 04/02/2023.</p> <p>4. GO AERO-2023: National Level Aero Technical-Cultural Fest held on 10-4-2023 & 11-4-2023.</p> <p>5. Young Engineers - Camp 2023 (Under Skill Lab) by Dr. Ramesh G & Mr. Jiniraj conducted on 24-4-2023 to 29-4-2023.</p> <p>6. Advanced Vibration Analysis-Hands on workshop by Mr. Ramakrishna, Enmaz Engineering Services Pvt. Ltd. By Dr. V Shankar Ex-Scientist NAL on 16-06-2023.</p>
j	Total Number of Skill Lab Sessions Conducted for First Year Students	4	4

k	What are the Outcomes?	<p>Students are able to:</p> <ol style="list-style-type: none"> 1. Demonstrate leadership qualities through active participation and engagement in various academic and extracurricular activities. 2. Showcase a diverse skill set acquired through hands-on experience in various engineering applications. 3. Think creatively and employ problem-solving skills to tackle challenges in the fields of aeronautical engineering. 4. Effectively communicate their ideas, research findings, and technical knowledge to both technical and non-technical audiences. 5. Collaborate with peers and professionals, demonstrating teamwork and interpersonal skills in multidisciplinary projects. 6. Adapt to different software tools to design and analyse engineering systems. 7. Demonstrate a strong work ethic, time management, and organizational skills in successfully completing the internship program. 8. Able to develop a mindset for continuous learning and improvement, fostering a lifelong passion for engineering and research. 	<p>Students are able to:</p> <ol style="list-style-type: none"> 1. Adapt to new technologies and tools relevant to their field of engineering. 2. Execute practical skills and apply theoretical knowledge in real-world scenarios. 3. Analyse complex problems and propose effective solutions using critical thinking and problem-solving skills. 4. Demonstrate a diverse skill set, including technical competencies and soft skills essential for their future careers. 5. Collaborate effectively with peers and professionals, demonstrating teamwork and interpersonal skills. 6. Showcase their creativity, innovation, and ability to think outside the box. 7. Develop leadership qualities, including decision-making, communication, and organizational skills.
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1	Total Investment Done by the Institute(s) to Establish an Exclusive Skill Lab (Recurring-Non recurring)	TOTAL = Rs. 14,43,202
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