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STATETECH HUB - COE

STATE OF TECHNOLOGY, COE FOR SPACE SCIENCES

DEPARTMENT OF SPACE TECHNOLOGY

DR. M. SURESH KUMAR

DR. M SURESH KUMAR, A DISTINGUISHED PROFESSIONAL IN ELECTRONIC AND COMMUNICATION ENGINEERING, BOASTS A PH.D. AND AN IMPRESSIVE SEVENTEEN YEARS OF TEACHING EXPERTISE, COUPLED WITH A YEAR IN THE INDUSTRY. HIS ACTIVE ENGAGEMENT IN CUTTING-EDGE RESEARCH SPANS AVIONICS, RADAR, AND NAVIGATION SYSTEMS, EVIDENT THROUGH MULTIPLE PUBLISHED RESEARCH PAPERS, CONFERENCE CONTRIBUTIONS, AND NUMEROUS BOOK CHAPTERS. WITH INDIAN AND INTERNATIONAL PATENTS IN AVIONIC/ELECTRONICS COMMUNICATION ENGINEERING, HE HAS AUTHORED AND EDITED SIX IMPACTFUL BOOKS, LEAVING A SIGNIFICANT MARK ON ACADEMIA. HIS INFLUENCE EXTENDS TO CURRICULUM DESIGN AND BOARD OF STUDIES (BOS) MEMBERSHIP AT RENOWNED INSTITUTIONS LIKE IGNOU, SANDIP UNIVERSITY, AND THE UNIVERSITY OF MUMBAI. GARNERING NUMEROUS PRIZES AND AWARDS THROUGHOUT HIS EDUCATIONAL JOURNEY, HE IS ESTEEMED AS A GUIDE FOR POSTGRADUATE AND PH.D. CANDIDATES AND HOLDS MEMBERSHIP IN PRESTIGIOUS ASSOCIATIONS INCLUDING AESI, AMIETE, IEEE, AMIE, AND MCSE.

ADVISOR

DR. MURALIDHAR PATKAR, EX. DRDO SCIENTIST, HONARARY ADVISOR

HOLDS PHD IN ENGINEERING AND HAS RESEARCH AND DEVELOPMENT EXPERIENCE IN ARMAMENTS AND MISSILE DEVELOPMENT. TEACHING EXPERIENCE OF ARMAMENT AND BASIC ENGINEERING SUBJECTS AT DEF INSTT OF ADVANCED TECHNOLOGY, AND PRESENTLY ADVISORY DIRECTOR FOR SHASTRI GROUP OF INSTITUTES IN ENGINEERING DISCIPLINE.
PROJECT MANAGEMENT, MANAGEMENT OF PERSONNEL, RESEARCH AND DEVELOPMENT, TEACHING ARE THE DISCIPLINES IN WHICH I HAVE EXPERTISE. I HAVE AN EXPERTISE IN PRANIC HEALING, HYPNOTHERAPY, STRUCTURE OF INTELLECT, AND OVERSEAS EDUCATION

DR. BHARAT BHUSHAN JOSHI, EX-JT DIR DRDO, HONARARY ADVISOR

41 YEARS' TECHNOCRAT EXPERIENCE IN DEFENCE; ENTREPRENEURSHIP; ACADEMICS; MCA QUALIFICATION FOR ID. PRESENTLY, ADVISOR TO INDUSTRIES. ACHIEVEMENTS - (A)DES. & DEV.: 13 CRITICAL MECHATRONICS 'REACTIVE AI' SUBSYSTEMS - WEAPON DEVELOPED IN MY LEADERSHIP. POSITIONS - GROUP DIRECTOR ARDE; DIRECTOR OPS, PROD, BD IN INDUSTRY. (B)LEADERSHIP: FOUNDER PRINCIPAL- CCOEW, (2011-22), PIVOTAL ROLE IN ADVANCING WOMEN'S EDUCATION; CREATION OF COE FOR AI/ ML, A PRIVATE UNIVERSITY AT PUNE (23-24). (C)RECOGNITIONS: HONORED WITH BEST YOUNG SCIENTIST AWARD - DRDO, 1997; COMMENDATION FOR OUTSTANDING CONTRIBUTION TO GUIDED MISSILES PROGRAM, 1990; 3 INDUSTRY AWARDS 2017-19 (D) AFFILIATIONS: FELLOW IETE/ IE AND SM - IEEE/ IDST. (E)COMMITTEES: BOS CHAIR DEFENCE & AEROSPACE, 2021 AND MEMBER - ELECTR. & TELECOM, 2018-21.

MEMBERS

DR. SURESH KUMAR M.
AVIONICS/UAV EXPERT

DR. M SURESH KUMAR, A DISTINGUISHED PROFESSIONAL IN ELECTRONIC AND COMMUNICATION ENGINEERING, BOASTS A PH.D. AND AN IMPRESSIVE SEVENTEEN YEARS OF TEACHING EXPERTISE, COUPLED WITH A YEAR IN THE INDUSTRY. HIS ACTIVE ENGAGEMENT IN CUTTING-EDGE RESEARCH SPANS AVIONICS, RADAR, AND NAVIGATION SYSTEMS, EVIDENT THROUGH MULTIPLE PUBLISHED RESEARCH PAPERS, CONFERENCE CONTRIBUTIONS, AND NUMEROUS BOOK CHAPTERS. WITH INDIAN AND INTERNATIONAL PATENTS IN AVIONIC/ELECTRONICS COMMUNICATION ENGINEERING, HE HAS AUTHORED AND EDITED SIX IMPACTFUL BOOKS, LEAVING A SIGNIFICANT MARK ON ACADEMIA. HIS INFLUENCE EXTENDS TO CURRICULUM DESIGN AND BOARD OF STUDIES (BOS) MEMBERSHIP AT RENOWNED INSTITUTIONS LIKE IGNOU, SANDIP UNIVERSITY, AND THE UNIVERSITY OF MUMBAI. GARNERING NUMEROUS PRIZES AND AWARDS THROUGHOUT HIS EDUCATIONAL JOURNEY.

DR. SHIVA PRASAD UPPU
PROPULSION EXPERT

WITH FIFTEEN YEARS OF EXPERIENCE IN HIGHER EDUCATION, SHIVA PRASAD UPPU IS ACTIVELY INVOLVED IN CUTTING-EDGE RESEARCH WITHIN THE REALMS OF EXPERIMENTAL AERODYNAMICS, ACOUSTICS, AND COMPUTATIONAL FLUID DYNAMICS. HIS FOCUS SPANS VARIOUS SUBFIELDS, INCLUDING COMPUTATIONAL FLUID DYNAMICS (CFD), EXPERIMENTAL AERODYNAMICS, FLUID DYNAMICS, HYPERSONIC AERODYNAMICS, PROPULSION, AND COMBUSTION. THROUGHOUT HIS EDUCATIONAL JOURNEY IN ENGINEERING, HE HAS EARNED NUMEROUS PRIZES AND AWARDS, WITH HIS INNOVATIONS GARNERING ATTENTION IN NEWS ARTICLES. AS A MEMBER OF PRESTIGIOUS ASSOCIATIONS SUCH AS AESI, AIAA, AND THE INTERNATIONAL ASSOCIATION OF ENGINEERS, HE CONTRIBUTES SIGNIFICANTLY TO THE SCIENTIFIC COMMUNITY.

DR. PRASHANT KUMAR
SPACE ORBITALS EXPERT

DR. PRASHANT KUMAR IS A DEDICATED ASSOCIATE PROFESSOR WITH AN ILLUSTRIOUS THIRTEEN YEAR CAREER IN TEACHING AND RESEARCH WITHIN THE AEROSPACE ENGINEERING DOMAIN. HAVING EARNED AN M.TECH. IN AERONAUTICAL ENGINEERING AND SUBSEQUENTLY COMPLETING A PH.D. IN AEROSPACE ENGINEERING, HE BRINGS A WEALTH OF ACADEMIC EXPERTISE TO HIS ROLE. HIS PROFESSIONAL JOURNEY INCLUDES OVER A YEAR OF INDUSTRY EXPERIENCE AT THE ESTEEMED NATIONAL AEROSPACE LABORATORY IN BANGALORE. HIS SCHOLARLY CONTRIBUTIONS ARE EVIDENT THROUGH THE PUBLICATION OF SIX PAPERS IN REPUTABLE JOURNALS, COUPLED WITH ACTIVE PARTICIPATION IN TWO INTERNATIONAL/NATIONAL CONFERENCES, HIGHLIGHTING HIS COMMITMENT TO ADVANCING KNOWLEDGE AND RESEARCH WITHIN THE AEROSPACE ENGINEERING DISCIPLINE.

DR SUCHISMITA SAMANTRAY
NANO MATERIAL SYMTHESIS & CHARACTERIZATION

DR. SUCHISMITA SAMANTRAY BRINGS OVER TWENTY-TWO YEARS OF DEDICATED EXPERIENCE IN TEACHING B.TECH AND M.TECH STUDENTS. HIS EXPERTISE LIES IN THE SYNTHESIS AND CHARACTERIZATION OF DOPED RARE-EARTH-BASED PEROVSKITE MANGANITES. HE EXTENDS TO DOPED MULTIFERROIC MANGANITES, TARGETING RARE-EARTH-BASED MANGANITES FOR THIN FILM FABRICATION USING SPUTTERING METHODS, AND EXPLORING NANOSTRUCTURES. HIS RESEARCH INTERESTS ALSO ENCOMPASS NOVEL METHODS OF MATERIALS PROCESSING, DESIGN, AND DEVICE DEVELOPMENT.

MR. VEERANJANEYULU K.
STRUCTURE EXPERT

A HIGHLY ACCOMPLISHED AEROSPACE STRUCTURES PROFESSIONAL WITH OVER 30 YEARS OF EXPERIENCE IN STRUCTURAL DESIGN, ANALYSIS, TESTING, AND CERTIFICATION OF AIRCRAFT AND AEROSPACE SYSTEMS. EXPERTISE INCLUDES FINITE ELEMENT ANALYSIS (FEA), STRESS ANALYSIS, FATIGUE AND FRACTURE MECHANICS, COMPOSITE STRUCTURES, AIRWORTHINESS COMPLIANCE, AND STRUCTURAL INTEGRITY ASSESSMENT. PROVEN TRACK RECORD OF LEADING MULTIDISCIPLINARY TEAMS, MANAGING COMPLEX AEROSPACE PROJECTS, AND CONTRIBUTING TO RESEARCH, DEVELOPMENT, AND CERTIFICATION OF AIRCRAFT STRUCTURES. EXTENSIVE EXPERIENCE IN ACADEMIA, INDUSTRY COLLABORATION, AND MENTORING ENGINEERS IN ADVANCED AEROSPACE STRUCTURAL TECHNOLOGIES.

DR SWAGATA PAUL
AERODYNAMICS EXPERT

AN ACCOMPLISHED AEROSPACE ENGINEERING PROFESSIONAL WITH EXTENSIVE EXPERIENCE IN TEACHING, RESEARCH, AND ACADEMIC ADMINISTRATION. EXPERTISE SPANS AERODYNAMICS, AIRCRAFT STRUCTURES, PROPULSION SYSTEMS, AVIONICS, UAV TECHNOLOGY, AND COMPUTATIONAL ANALYSIS. ACTIVE INVOLVEMENT IN RESEARCH PROJECTS, LABORATORY DEVELOPMENT, INDUSTRY COLLABORATIONS, AND CURRICULUM DESIGN. STRONG FOCUS ON EXPERIENTIAL LEARNING, INNOVATION, AND SKILL DEVELOPMENT THROUGH INTERNSHIPS, WORKSHOPS, AND HANDS-ON TRAINING. COMMITTED TO ADVANCING AEROSPACE EDUCATION AND FOSTERING INDUSTRY-READY PROFESSIONALS EQUIPPED TO MEET THE EVOLVING DEMANDS OF THE AVIATION AND SPACE SECTORS.

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RESEARCH AREAS

SPACE PROPULSION

THE PROPULSION SYSTEMS RESEARCH AREA FOCUSES ON THE ADVANCEMENT OF TECHNOLOGIES THAT GENERATE THRUST FOR AIRCRAFT, SPACECRAFT, AND UNMANNED AERIAL VEHICLES. RESEARCH ACTIVITIES INCLUDE THE DESIGN AND PERFORMANCE ANALYSIS OF GAS TURBINE ENGINES, TURBOJETS, TURBOFANS, RAMJETS, SCRAMJETS, ROCKET ENGINES, AND HYBRID PROPULSION SYSTEMS. FACULTY AND STUDENTS INVESTIGATE COMBUSTION PROCESSES, FUEL INJECTION MECHANISMS, AND THERMAL MANAGEMENT TECHNIQUES TO IMPROVE PROPULSION EFFICIENCY AND RELIABILITY. COMPUTATIONAL FLUID DYNAMICS (CFD) AND EXPERIMENTAL TESTING ARE UTILIZED TO STUDY FLOW BEHAVIOR AND COMBUSTION CHARACTERISTICS WITHIN PROPULSION DEVICES. RESEARCH ALSO EXPLORES ALTERNATIVE AND SUSTAINABLE FUELS, INCLUDING BIOFUELS, HYDROGEN, AND ELECTRIC PROPULSION TECHNOLOGIES. EMPHASIS IS PLACED ON REDUCING EMISSIONS, IMPROVING FUEL ECONOMY, AND ENHANCING OVERALL SYSTEM PERFORMANCE. STUDIES ON PROPULSION INTEGRATION WITH AIRCRAFT AND SPACECRAFT SYSTEMS ARE CONDUCTED TO OPTIMIZE MISSION CAPABILITIES. ADVANCED MATERIALS FOR HIGH-TEMPERATURE APPLICATIONS AND PROPULSION COMPONENT DURABILITY ARE ALSO INVESTIGATED. THE RESEARCH SUPPORTS INNOVATIONS IN BOTH ATMOSPHERIC AND SPACE TRANSPORTATION SYSTEMS. COLLABORATION WITH INDUSTRY AND RESEARCH ORGANIZATIONS PROVIDES OPPORTUNITIES FOR PRACTICAL IMPLEMENTATION AND TECHNOLOGY DEVELOPMENT. THE AREA CONTRIBUTES TO THE DEVELOPMENT OF NEXT-GENERATION AEROSPACE PROPULSION SOLUTIONS FOR COMMERCIAL, DEFENSE, AND SPACE APPLICATIONS.

ORBITAL MECHANICS & SPACE SYSTEM

THE ORBITAL MECHANICS AND SPACE SYSTEMS RESEARCH AREA FOCUSES ON THE SCIENTIFIC AND ENGINEERING PRINCIPLES GOVERNING SPACECRAFT MOTION AND SPACE MISSIONS. RESEARCH INCLUDES ORBITAL DYNAMICS, TRAJECTORY OPTIMIZATION, MISSION DESIGN, AND SPACECRAFT NAVIGATION FOR EARTH-ORBITING AND INTERPLANETARY MISSIONS. STUDIES ARE CONDUCTED ON SATELLITE DEPLOYMENT STRATEGIES, CONSTELLATION DESIGN, RENDEZVOUS OPERATIONS, AND ORBITAL MANEUVER PLANNING. RESEARCHERS INVESTIGATE PERTURBATION EFFECTS CAUSED BY ATMOSPHERIC DRAG, GRAVITATIONAL VARIATIONS, SOLAR RADIATION PRESSURE, AND THIRD-BODY INFLUENCES. ADVANCED ALGORITHMS ARE DEVELOPED FOR ORBIT DETERMINATION, ATTITUDE CONTROL, AND AUTONOMOUS SPACECRAFT GUIDANCE. THE AREA ALSO EXPLORES MISSION PLANNING FOR LUNAR, MARTIAN, AND DEEP-SPACE EXPLORATION PROGRAMS. SPACECRAFT SUBSYSTEM INTEGRATION, INCLUDING PROPULSION, POWER, COMMUNICATION, AND THERMAL CONTROL SYSTEMS, FORMS AN IMPORTANT COMPONENT OF RESEARCH. NUMERICAL SIMULATIONS AND ANALYTICAL MODELS ARE EMPLOYED TO EVALUATE MISSION FEASIBILITY AND OPTIMIZE OPERATIONAL PERFORMANCE. RESEARCH CONTRIBUTES TO SATELLITE TECHNOLOGY DEVELOPMENT FOR COMMUNICATION, NAVIGATION, REMOTE SENSING, AND SCIENTIFIC APPLICATIONS. EMERGING TOPICS SUCH AS SPACE SITUATIONAL AWARENESS, SPACE DEBRIS MITIGATION, AND AUTONOMOUS SPACE OPERATIONS ARE ALSO ADDRESSED. THIS RESEARCH AREA SUPPORTS ADVANCEMENTS IN SPACE EXPLORATION AND THE GROWING GLOBAL SPACE INDUSTRY.

AERODYNAMICS

THE AERODYNAMICS RESEARCH AREA FOCUSES ON UNDERSTANDING AND CONTROLLING AIRFLOW AROUND AEROSPACE VEHICLES TO IMPROVE PERFORMANCE, STABILITY, AND EFFICIENCY. RESEARCH ACTIVITIES INCLUDE COMPUTATIONAL AND EXPERIMENTAL STUDIES OF SUBSONIC, TRANSONIC, SUPERSONIC, AND HYPERSONIC FLOW REGIMES. ADVANCED COMPUTATIONAL FLUID DYNAMICS (CFD) TECHNIQUES ARE EMPLOYED TO ANALYZE COMPLEX AERODYNAMIC PHENOMENA. WIND TUNNEL TESTING IS CONDUCTED TO VALIDATE NUMERICAL PREDICTIONS AND INVESTIGATE FLOW BEHAVIOR UNDER CONTROLLED CONDITIONS. RESEARCHERS STUDY BOUNDARY LAYER DEVELOPMENT, TURBULENCE MODELING, FLOW SEPARATION, VORTEX DYNAMICS, AND WAKE INTERACTIONS. AERODYNAMIC OPTIMIZATION TECHNIQUES ARE APPLIED TO AIRCRAFT WINGS, FUSELAGE CONFIGURATIONS, ROTOR BLADES, UAVS, AND LAUNCH VEHICLES. FLOW CONTROL STRATEGIES USING PASSIVE AND ACTIVE METHODS ARE EXPLORED TO REDUCE DRAG AND ENHANCE LIFT CHARACTERISTICS. STUDIES ON HIGH-LIFT DEVICES AND AERODYNAMIC PERFORMANCE IMPROVEMENT ARE CARRIED OUT FOR MODERN AIRCRAFT DESIGNS. RESEARCH ALSO ADDRESSES AERODYNAMIC HEATING AND THERMAL EFFECTS ENCOUNTERED IN HIGH-SPEED FLIGHT. THE AREA SUPPORTS THE DEVELOPMENT OF EFFICIENT AND ENVIRONMENTALLY SUSTAINABLE AEROSPACE SYSTEMS. OUTCOMES CONTRIBUTE TO ENHANCED FLIGHT PERFORMANCE, REDUCED FUEL CONSUMPTION, AND IMPROVED OPERATIONAL CAPABILITIES.

STRUCTURES

THE STRUCTURES RESEARCH AREA IS DEDICATED TO THE ANALYSIS, DESIGN, AND OPTIMIZATION OF AEROSPACE STRUCTURAL SYSTEMS. RESEARCH FOCUSES ON ENSURING STRUCTURAL INTEGRITY, RELIABILITY, AND LIGHTWEIGHT DESIGN FOR AIRCRAFT, SPACECRAFT, AND UAVS. INVESTIGATIONS INCLUDE STRESS ANALYSIS, STRAIN MEASUREMENT, FATIGUE LIFE PREDICTION, FRACTURE MECHANICS, AND FAILURE ASSESSMENT OF AEROSPACE COMPONENTS. COMPOSITE MATERIALS AND ADVANCED LIGHTWEIGHT STRUCTURES ARE EXTENSIVELY STUDIED TO IMPROVE STRENGTH-TO-WEIGHT RATIOS. RESEARCHERS EMPLOY ANALYTICAL, NUMERICAL, AND EXPERIMENTAL TECHNIQUES TO EVALUATE STRUCTURAL PERFORMANCE UNDER STATIC AND DYNAMIC LOADING CONDITIONS. STRUCTURAL HEALTH MONITORING SYSTEMS USING SENSORS AND SMART MATERIALS ARE DEVELOPED FOR REAL-TIME CONDITION ASSESSMENT. AEROELASTIC PHENOMENA SUCH AS FLUTTER, DIVERGENCE, AND VIBRATION SUPPRESSION ARE IMPORTANT AREAS OF STUDY. FINITE ELEMENT ANALYSIS (FEA) IS UTILIZED TO MODEL COMPLEX AEROSPACE STRUCTURES AND PREDICT THEIR BEHAVIOR. RESEARCH ALSO EXPLORES ADDITIVE MANUFACTURING AND ADVANCED FABRICATION TECHNIQUES FOR AEROSPACE APPLICATIONS. IMPACT RESISTANCE, CRASHWORTHINESS, AND DAMAGE TOLERANCE ARE INVESTIGATED TO ENHANCE OPERATIONAL SAFETY. THE AREA CONTRIBUTES TO THE DEVELOPMENT OF INNOVATIVE STRUCTURAL SOLUTIONS CAPABLE OF MEETING FUTURE AEROSPACE CHALLENGES.

AVIONICS/ UAV

THE UAV AND AVIONICS RESEARCH AREA FOCUSES ON THE DEVELOPMENT OF INTELLIGENT, AUTONOMOUS, AND RELIABLE AEROSPACE SYSTEMS. RESEARCH ENCOMPASSES THE DESIGN AND OPTIMIZATION OF UNMANNED AERIAL VEHICLES (UAVS) FOR CIVIL, DEFENSE, AGRICULTURAL, SURVEILLANCE, AND DISASTER MANAGEMENT APPLICATIONS. ACTIVITIES INCLUDE FLIGHT DYNAMICS ANALYSIS, AUTONOMOUS NAVIGATION, GUIDANCE AND CONTROL SYSTEM DEVELOPMENT, AND MISSION PLANNING. RESEARCHERS WORK ON ADVANCED AVIONICS SYSTEMS INTEGRATING SENSORS, COMMUNICATION NETWORKS, AND ONBOARD COMPUTING PLATFORMS. STUDIES INVOLVE GLOBAL NAVIGATION SATELLITE SYSTEMS (GNSS), INERTIAL NAVIGATION SYSTEMS, FLIGHT MANAGEMENT SYSTEMS, AND REAL-TIME DATA PROCESSING. ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING TECHNIQUES ARE APPLIED TO ENHANCE AUTONOMOUS DECISION-MAKING AND FAULT DETECTION CAPABILITIES. RESEARCH ALSO ADDRESSES UAV SWARM TECHNOLOGIES, COOPERATIVE CONTROL STRATEGIES, AND HUMAN-MACHINE INTERACTION. EMBEDDED SYSTEMS AND HARDWARE-IN-THE-LOOP SIMULATIONS ARE EMPLOYED TO VALIDATE AVIONICS DESIGNS. CYBERSECURITY ASPECTS OF AEROSPACE COMMUNICATION AND CONTROL SYSTEMS ARE ALSO EXPLORED. THE RESEARCH AIMS TO IMPROVE SAFETY, EFFICIENCY, AND OPERATIONAL CAPABILITIES OF MODERN AEROSPACE VEHICLES. THIS AREA SUPPORTS THE ADVANCEMENT OF SMART AERIAL PLATFORMS CAPABLE OF OPERATING IN COMPLEX AND DYNAMIC ENVIRONMENTS.

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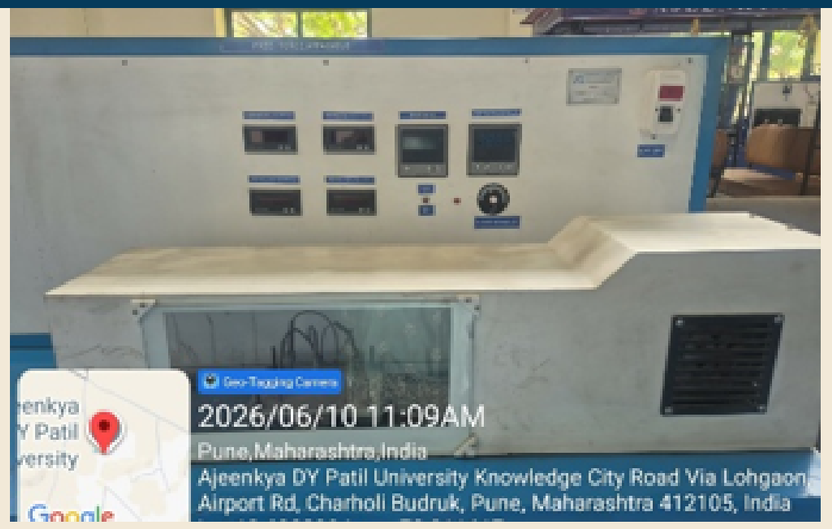
RESEARCH EQUIPMENTS

SPACE PROPULSION LAB



FREE FORCE CONVECTION APPARATUS

THE FREE AND FORCED CONVECTION APPARATUS IS USED TO STUDY HEAT TRANSFER FROM A HEATED SURFACE TO THE SURROUNDING AIR UNDER NATURAL AND FORCED CONVECTION MODES. THE SETUP CONSISTS OF AN ELECTRIC HEATER, TEMPERATURE SENSORS, AIRFLOW CONTROL UNIT, AND DIGITAL DISPLAY PANEL. IT ENABLES MEASUREMENT OF TEMPERATURE DISTRIBUTION AND CALCULATION OF CONVECTIVE HEAT TRANSFER COEFFICIENTS AT DIFFERENT AIRFLOW RATES. THE APPARATUS IS WIDELY USED IN THERMAL ENGINEERING AND AEROSPACE LABORATORIES TO UNDERSTAND CONVECTION HEAT TRANSFER PHENOMENA AND COOLING SYSTEM DESIGN.

AERODYNAMIMCS LAB

LOW SUBSONIC WIND TUNNEL (600X600MM)

THE LOW SUBSONIC WIND TUNNEL (600 × 600 MM) IS DESIGNED TO STUDY AERODYNAMIC CHARACTERISTICS OF MODELS UNDER CONTROLLED AIRFLOW CONDITIONS. THE SETUP CONSISTS OF A SETTLING CHAMBER, CONTRACTION SECTION, TEST SECTION, DIFFUSER, AND DRIVE FAN TO PROVIDE UNIFORM SUBSONIC AIRFLOW. IT ENABLES MEASUREMENT OF LIFT, DRAG, PRESSURE DISTRIBUTION, AND FLOW BEHAVIOR AROUND AERODYNAMIC BODIES. THE WIND TUNNEL IS WIDELY USED IN AEROSPACE ENGINEERING LABORATORIES FOR AERODYNAMIC RESEARCH, AIRCRAFT DESIGN STUDIES, FLOW VISUALIZATION, AND PERFORMANCE EVALUATION OF AIRFOILS AND SCALED AIRCRAFT MODELS.

STRUCTURES LAB

COMBINED BENDING & TORSION

THE COMBINED BENDING AND TORSION APPARATUS IS USED TO STUDY THE BEHAVIOR OF STRUCTURAL MEMBERS SUBJECTED SIMULTANEOUSLY TO BENDING MOMENTS AND TORSIONAL LOADS. THE SETUP ENABLES MEASUREMENT OF STRESSES, STRAINS, AND ANGULAR DEFORMATION UNDER DIFFERENT LOADING CONDITIONS. STUDENTS CAN ANALYZE THE COMBINED EFFECT OF BENDING AND TORSION AND COMPARE EXPERIMENTAL RESULTS WITH THEORETICAL PREDICTIONS. THE APPARATUS IS WIDELY USED IN AEROSPACE, MECHANICAL, AND CIVIL ENGINEERING LABORATORIES FOR STRUCTURAL ANALYSIS, SHAFT DESIGN, AND STRENGTH OF MATERIALS STUDIES.

AVIONICS LAB

SCIENTECH 2210 – DSB/SSB AM TRANSMITTER TRAINER

IT IS A COMMUNICATION ENGINEERING TRAINING KIT THAT HELPS STUDENTS UNDERSTAND THE GENERATION AND TRANSMISSION OF DOUBLE SIDEBAND (DSB) AND SINGLE SIDEBAND (SSB) AM SIGNALS. IT PROVIDES HANDS-ON EXPERIENCE IN MODULATION TECHNIQUES, SIGNAL ANALYSIS, AND TRANSMITTER OPERATION THROUGH BUILT-IN TEST POINTS AND FAULT SIMULATION FEATURES.