SRI MANAKULA VINAYAGAR
ENGINEERING COLLEGE
AN AUTONOMOUS INSTITUTION

DEPARTMENT OF MECHATRONICS

DRONE MAVERICKS CLUB

ANNUAL REPORT

(Academic Year: 2023 to 2024)

Submitted by
Mrs.S.Kalaimani
Assistant Professor
Faculty Coordinator

Preface

The club strongly emphasizes practical and progressive learning in UAV technology. The activities are structured to move from foundational concepts of drone electronics to advanced programming and system integration. Students are given hands-on exposure to flight controllers, embedded systems, sensors, and power distribution modules. A major preference is placed on real-time programming, PID tuning, and communication protocols for stable drone operation. The club also prioritizes safe handling of Li-Po batteries and high-current electronic components. Calibration of IMU, GPS, and compass systems forms an important part of training. Pre-flight testing sessions are conducted to ensure operational reliability and risk reduction. Learners develop troubleshooting skills through hardware assembly and fault diagnosis. The program encourages disciplined aviation practices and adherence to safety standards. Overall, the club prefers skill-based, application-oriented learning that prepares students for professional UAV development and real-world drone operations.

Faculty Coordinator
Mrs. S.Kalaimani

HoD/ MCTR
Dr. G.B.M. Mohan Raj

IQAC Coordinator
Dr. Arivalagar A A

Director Cum Principal
Dr.V.S.K. Venkatachalapathy

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ABOUT THE INSTITUTE

Sri Manakula Vinayaga Educational Trust was founded to provide quality and affordable education to the weaker sections of society. The trust established Sri Manakula Vinayagar Engineering College (SMVEC) in 1999. SMVEC is an autonomous institution affiliated to Pondicherry University. It offers 13 undergraduate, 8 postgraduate and 11 Research programs in engineering. SMVEC has been accredited by NAAC with “A” grade and NBA. The institution is also accredited by TATA consultancy services. The college has a good placement record with students getting job offers from top companies in India and abroad. SMVEC students have won many awards and accolades for their academic achievements. To be globally recognized for excellence in quality education, innovation and research for the transformation of lives to serve the society.

Vision

- To nurture the cornerstone of excellence in engineering education and drive innovation by seamlessly integrating the fundamentals of Science and Humanities

Mission

M1: Quality Education : To provide comprehensive academic system that amalgamates the cutting edge technologies with best practices.

M2: Research and Innovation : To foster value-based research and innovation in collaboration with industries and institutions globally for creating intellectuals with new avenues.

M3: Employability and Entrepreneurship : To inculcate the employability and entrepreneurial skills through value and skill based training.

M4: Ethical Values : To instill deep sense of human values by blending societal righteousness with academic professionalism for the growth of society.

ABOUT THE DEPARTMENT

The Department of Mechatronics Engineering is a top-notch department that offers high-quality UG, PG and PhD programs. The UG program B.Tech - Mechatronics Engineering is accredited by the National Accreditation Board, AICTE-New Delhi, and has a placement record of over 80%. The department's graduates are highly sought-after by employers in the Mechatronics sector.

Our department contributes significantly to achieving the national objective of envisioning the world with a clear and deep commitment and a sincere desire to meet the expectations of a rising, fast-developing technology.

Vision

To be a department with outstanding competencies in education and research in interdisciplinary field of Mechatronics Engineering for the prosperity of students and society.

Mission

- **Quality Integration:** To upfold excellence in education by integrating the teaching learning process with hands on trainings in updated technologies.
- **Research Exploration:** To maintain a dynamic balance between learning and research by encompassing activities related to Research, Industrial projects and Innovation Contests.
- **Personality Development:** To enrich the team spirit and entrepreneurship skills through training programmes on personality development for career prospects.
- **Social Ethics:** To enhance the principle of highest ethical values by inculcating code of conduct for the betterment of the Society.

Programmes offered

- B.Tech - Mechatronics Engineering
- M.Tech - Mechatronics Engineering
- M.Tech - VLSI & Embedded Systems
- Ph.D - Mechatronics Engineering

ABOUT DRONE MAVERICKS CLUB

The Drone Mavericks Club from the Department of Mechatronics focuses on advancing knowledge in UAV technology, embedded systems, and intelligent automation under the theme “Empowering the Future through Smart Drone Systems.” The club provides a practical platform for students to apply theoretical concepts through hands-on drone design, programming, and electronics integration. Activities include flight controller coding, sensor calibration, system testing, and safe flight operations. Through workshops, technical sessions, and competitions, members develop strong problem-solving, teamwork, and industry-relevant skills. By combining innovation with disciplined engineering practices, the club prepares students for emerging careers in drone technology, robotics, and automation.

Objectives of Drone Maverick Club

The primary goal of robotics club are as follows:

- To foster hands-on skills in designing, building, and programming robots, enabling students to bridge the gap between theoretical concepts and practical applications.
- To encourage innovative thinking and creative problem-solving by challenging students to develop unique robotic and automation solutions.
- To keep members updated on the latest advancements in robotics and automation technologies through workshops, webinars, and expert talks.
- To prepare students for national and international robotics competitions by providing resources, guidance, and a platform for experimentation.
- To inspire research in emerging areas of robotics and automation, such as AI, machine learning, IoT, and human-robot interaction.
- To promote teamwork and collaboration among students from various disciplines for solving complex engineering problems.

OFFICE BEARERS

The Drone Club is guided by a dedicated team of office bearers who play an essential role in steering the club's initiatives and fostering innovation in UAV technology. This leadership team typically includes a President, Vice President, Secretary, Treasurer, and Technical Coordinators, each bringing unique skills and responsibilities to the table.

Roles and Responsibilities

- Organizing Workshops:They plan and execute educational sessions.
- Managing Equipment: They oversee the club's drone resources and equipment.
- Mentoring: They provide guidance to junior members.
- Supervising Projects: They oversee flight testing and project development.

Their collaborative efforts ensure the seamless operation of training sessions, technical events, and hands-on building activities. By promoting teamwork, discipline, and safety-focused practices, they cultivate a robust learning atmosphere. Through their leadership, the club continues to thrive as a center of excellence in drone technology, serving as a launchpad for aspiring UAV engineers and innovators.

Mrs. S. Kalaimani
Professor Faculty Coordinator

Kalimuthu C
President
III

Mohamed Riyas M
Vice President
III

Santhosh A
Secretary
III

Thanesh T
Technical Head
III

LIST OF EVENTS

S. No	Title of the Events
01	Basic Programming for Flight Controllers
02	Drone Calibration & Pre-Flight Testing Sessions

Basic Programming for Flight Controllers

Basic programming for flight controllers involves learning how to write the software that controls the core functions of a drone. The flight controller is essentially the “brain” of the drone, responsible for reading data from sensors and translating it into smooth and stable flight. Through programming, the controller processes inputs from gyroscopes, accelerometers, GPS, barometers, and the pilot’s remote commands. Using this information, it decides how fast each motor should spin in order to maintain balance, climb, descend, turn, or hover steadily in the air.
In this topic, students are introduced to fundamental programming concepts such as loops, conditional statements, and real-time execution, which are essential for handling continuous sensor data. They also learn how communication protocols like I2C, SPI, and UART are used to connect the flight controller with sensors and external modules. Another key area is PID (Proportional–Integral–Derivative) control tuning, which ensures that the drone remains stable and responsive. Practical work may include uploading firmware to controllers such as Arduino-based boards, Beta flight, Autopilot, or PX4, and testing behavior changes through code adjustments.

- Total Participants: 60 Students
- Year of students: I, II, III and IV
- Venue : Department of Mechatronics
- Date : 23/08/2023
- Event Coordinator: Mrs. S. Kalaimani
- Mode of seminar: Offline

Objective of the Seminar

- To provide a comprehensive understanding of drone technology, its components, and real-world applications
- To introduce fundamental concepts of UAV systems including electronics, flight controllers, sensors, and communication modules
- To emphasize the importance of safety standards, calibration procedures, and structured flight operations.
- To inspire innovation and encourage students to explore advanced areas such as embedded programming, autonomous navigation, and intelligent control systems.

Outcome of the Seminar

- Participants gained a clear understanding of the fundamental concepts of drone technology and UAV operations.
- To create interest among the students towards industry automation.
- To make the students interact with the resource person for knowledge transfer.

CIRCULAR

SRI MANAKULA VINAYAGAR ENGINEERING COLLEGE
(AN AUTONOMOUS INSTITUTION)

DEPARTMENT OF MECHATRONICS

SMVEC/MCTR/GL/2024-25/ Date: 22.03.2023

CIRCULAR

(For Students)

This is to inform that a **seminar** is planned for the **students of the Department of Mechatronics Engineering** on the topic **"Basic Programming for Flight Controllers"** organized by the **Drone Club** . In this regard, students are requested to gather in Hall 1.

PROGRAMME COORDINATOR
(Mrs. S. Kalaimani)

HOD/MCTR
(Dr. G.B.M. Mohan Raj)

PHOTO GALLERY

Drone Calibration & Pre-Flight Testing Sessions

Drone Calibration & Pre-Flight Testing Sessions are essential activities carried out to ensure that a drone is fully prepared, safe, and technically accurate before take-off. These sessions focus on fine-tuning the drone's onboard systems—such as the Inertial Measurement Unit (IMU), gyroscope, compass, GPS, and Electronic Speed Controllers —to make sure the flight controller receives correct sensor data.

Proper calibration helps the drone maintain stability, orientation, and accurate positioning during flight, especially in mission-critical applications like surveying, mapping, inspection, and rescue operations. Alongside calibration, structured pre-flight testing is performed to verify battery condition, propeller alignment, motor performance, firmware status, remote-control signal strength, GPS lock, and failsafe features such as Return-to-Home.

- Total Participants: 55 Students
- Year of students: I, II, III and IV
- Venue : Department of Mechatronics
- Date : 23/01/2024
- Event Coordinator: Mrs. S. Kalaimani
- Mode of seminar: Offline

Objective of the Seminar

- To provide a comprehensive understanding of drone technology, its components, and real-world applications
- To introduce fundamental concepts of UAV systems including electronics, flight controllers, sensors, and communication modules
- To emphasize the importance of safety standards, calibration procedures, and structured flight operations.
- To inspire innovation and encourage students to explore advanced areas such as embedded programming, autonomous navigation, and intelligent control systems.

Outcome of the Seminar

- Participants gained a clear understanding of the fundamental concepts of drone technology and UAV operations.
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CIRCULAR

SRI MANAKULA VINAYAGAR ENGINEERING COLLEGE
(AN AUTONOMOUS INSTITUTION)

DEPARTMENT OF MECHATRONICS

SMVEC/MCTR/GL/2024-25/15 Date: 21.01.2024

CIRCULAR

(For Students)

This is to inform that a **hands-on session** on **"Drone Calibration & Pre-Flight Testing"** is organized by the **Drone Club, Department of Mechatronics Engineering** on 23.01.2024 at Tuesday. Students are requested to gather at Hall 1 and participate actively.

PROGRAMME COORDINATOR
(Mrs. S. Kalaimani)

HOD/MCTR
(Dr. G.B.M. Mohan Raj)

PHOTO GALLERY

STUDENT FEEDBACK

The pie chart illustrates the overall satisfaction level of students regarding the Drone Mavericks Club activities conducted during the academic year 2023–2024. It is observed that 75% of students rated the activities as Excellent or Very Good, reflecting a strong level of satisfaction and positive engagement. Additionally, 15% rated the activities as Good, indicating overall favorable feedback. A small percentage of 7% rated the activities as Average, while only 3% expressed lower satisfaction. Overall, the feedback highlights the club's effective organization, technical value, and positive impact on students' learning experience.