

MEMORANDUM OF UNDERSTANDING (MoU) For Establishment of a Drone Centre of Excellence (CoE)

This Memorandum of Understanding (hereinafter referred to as the "MoU") is entered into on this 06 day of October 2025,

BETWEEN

Flydronics Solutions Pvt. Ltd.,
a company engaged in drone technology solutions, training, R&D, and industrial UAV applications,
having its registered office at _____,
hereinafter referred to as "FLYDRONICS",

AND

CMR Technical Campus (CMRTC), located in Hyderabad, Telangana, is an AICTE-approved institution affiliated with Jawaharlal Nehru Technological University, Hyderabad (JNTUH). The institute is committed to delivering quality technical education through a strong academic framework, experienced faculty, modern infrastructure, and industry-oriented learning practices. CMRTC emphasizes innovation, research, and skill development to prepare students for successful careers in engineering, technology, entrepreneurship. hereinafter referred to as "the Institution" or "CMRTC".
FLYDRONICS and CMRTC are hereinafter individually referred to as a "Party" and collectively as the "Parties."

1. INTRODUCTION

FLYDRONICS Solutions Pvt. Ltd., a pioneering organization in drone technology training, research, manufacturing, and industry-driven UAV solutions, proposes a strategic collaboration with CMR Technical Campus (CMRTC) to establish a state-of-the-art **Drone Centre of Excellence (CoE)** at its Hyderabad campus.

This partnership aims to create a dynamic ecosystem for skill development, hands-on technical training, applied research, innovation, and industry integration within the rapidly expanding Unmanned Aerial Vehicle (UAV) sector. The proposed Centre of Excellence will serve as a hub for advanced learning, live projects, certifications, internships, and startup incubation in drone technology.

Through this initiative, CMRTC will strengthen its academic-industry interface, enhance student employability, foster research-driven innovation, and position itself as a regional leader in emerging UAV technologies and next-generation aerospace education.

1.1 FLYDRONICS OFFERINGS

FLYDRONICS shall provide the following support and resources:

S.No.	Offering Category	Details
1	Drone Equipment	Training& agricultural drones
2	Testing Infrastructure	Drone testing, assembly, and calibration equipment
3	Workstations	Drone workstations and maintenance tools
4	Manufacturing Support	Manufacturing capability for customized drone applications
5	Technical Expertise	Industry-aligned technical expertise and mentorship
6	Faculty Development	Faculty Development Programs (FDPs)
7	Research Support	Research and innovation support
8	Curriculum	DGCA-aligned training curriculum
9	Trainers	Licensed trainers and industry experts
10	Simulation	Flight simulators integrated with LMS platforms
11	Career Support	Internship, project, and startup support

2. ABOUT CMR TECHNICAL CAMPUS (CMRTC)

CMR Technical Campus (CMRTC) is a premier engineering institution committed to academic excellence, innovation, and industry-driven education in the state of Telangana.

2.1 Institutional Profile

Parameter	Details
Institution Name	CMR Technical Campus
Location	Hyderabad, Telangana
Regulatory Approval	AICTE Approved
University Affiliation	Jawaharlal Nehru Technological University, Hyderabad (JNTUH)
Programs Offered	UG and PG Programs in Engineering, Technology, and Management
Accreditations	NBA Accredited Programs, NAAC Accredited
Established	[Year of Establishment]
Campus Area	[Campus Area in Acres]

2.2 Institutional Vision

CMRTC envisions becoming a center of excellence in technical education by nurturing innovation, research, and entrepreneurship while maintaining the highest standards of academic integrity and industry relevance.

2.3 Institutional Mission

- To provide quality education through innovative teaching-learning methodologies
- To foster research culture and industry collaboration
- To develop skilled professionals with strong ethical values
- To promote entrepreneurship and lifelong learning
- To contribute to societal development through technology transfer

2.4 Core Strengths

CMRTC emphasizes practical learning, research orientation, and skill-based education aligned with emerging technologies and industry needs. The institution has a proven track record of:

- Strong placement records with leading national and multinational companies
- Active research contributions with publications in reputed journals
- Industry collaborations and MoUs with leading organizations
- State-of-the-art laboratories and infrastructure
- Experienced and dedicated faculty members
- Active student clubs and technical societies
- Incubation center supporting student startups

2.5 Relevant Departments for Drone CoE

The following departments at CMRTC shall actively participate in the DroneCentre of Excellence:

Department	Relevance to Drone CoE
Computer Science and Engineering	AI/ML, Software Development, Data Analytics
Electronics and Communication Engineering	Embedded Systems, Communication Protocols, Sensors
Electrical and Electronics Engineering	Power Systems, Motor Control, Battery Management
Mechanical Engineering	Aerodynamics, Structural Design, CAD/CAM
Civil Engineering	Surveying, GIS, Infrastructure Monitoring
Information Technology	IoT, Cloud Computing, Cybersecurity
Artificial Intelligence & Data Science	Machine Learning, Computer Vision, Predictive Analytics

3. OBJECTIVE

To establish a high-impact, sustainable Drone Centre of Excellence that integrates:

S.No.	Objective Area	Description
1	Drone Education	Comprehensive drone education & hands-on training programs
2	Skill Development	Industry-relevant skill development & certification pathways
3	Research & Innovation	Applied research & innovation in UAV technologies

S.No.	Objective Area	Description
	Industry	
4	Collaboration	Industry collaboration, consultancy & startup incubation Extension activities and community service through drone
5	Community Outreach applications	

4. REQUIREMENTS FROM THE INSTITUTION

A. Infrastructure Requirements

Requirement	Description	Quantity / Size	CMRTC Commitment
Lab/Classroom Space	Smart classroom/lab with seating, projector, and power outlets	1 Room (Minimum 800 sq. ft)	☐ Available ☐ To be arranged
Drone Storage & Charging Room	Secure room with charging sockets and ventilation	1 Room (100–150 sq. ft) Minimum 100 ft x 100 ft (away from buildings/trees/electrical poles, wires)	☐ Available ☐ To be arranged
Outdoor Flying Zone	Open area for drone test flights		☐ Available ☐ To be arranged
Faculty Room	Desk space for visiting trainers or technical staff	Shared or Dedicated cabin	☐ Available ☐ To be arranged
Workshop Area (optional)	For drone assembly & maintenance training	1 Room (if available)	☐ Available ☐ To be arranged

B. Equipment & Utility Support

Item	Requirement	CMRTC Commitment
Tables & Chairs	50–60 student capacity	☐ Available ☐ To be arranged

Item	Requirement	CMRTC Commitmen
LCD Projector/Smart Board	1 Unit	☐ Available ☐ To be arranged
High-speed Internet	Wi-Fi or LAN in training room (Minimum 100 Mbps)	☐ Available ☐ To be arranged
Power Backup	Inverter or UPS for classroom, Lab & charging room	☐ Available ☐ To be arranged
Air Conditioning	Recommended for lab/classroom	☐ Available ☐ To be arranged
Fire Extinguisher	1 unit (safety compliance)	☐ Available ☐ To be arranged

C. Technical & Administrative Support

Requirement	Description	CMRTC Nominated Personnel
COE Coordinator	1 faculty member to act as liaison with FLYDRONICS	Name: _____ Designation: _____ Department: _____ Contact: _____

5. STUDENT FACILITIES

CMRTC shall ensure the following student facilities for the effective operation of the Drone CoE:

S.No.	Facility	Details
1	Student Access	Access to students from Engineering, Agriculture, Science & Media streams
2	Event Permissions	Permission for workshops, competitions, demo flights on campus
3	Promotion Support	Campus-wide promotion of drone programs through official channels
4	Accommodation Support	Accommodation & food support (if required for FDPs / residential programs)
5	Credit Integration	Integration of drone courses with academic credits (subject to university approval)
6	Certificate Recognition	Official recognition of certifications in student transcripts

6. BENEFITS TO THE INSTITUTION (ACCREDITATION, REGULATORY AND STRATEGIC IMPACT)

The establishment of the Drone Centre of Excellence (CoE) under this Memorandum of Understanding shall provide structured, measurable, and long-term academic, research, innovation, and employability benefits to CMRTC. The benefits outlined in Clauses 6.1 to 6.8 are directly aligned with national regulatory frameworks, accreditation requirements, and global sustainability goals, and shall be considered integral outcomes of this collaboration.

6.1 Alignment with UGC and AICTE Regulations

The Drone Centre of Excellence (CoE) directly supports compliance with AICTE and UGC regulatory frameworks by institutionalizing industry–academia collaboration, experiential learning, faculty capacity building, and emerging technology adoption.

Key Compliance Areas:

- The jointly governed Drone CoE and associated MoU provide formal evidence of industry partnership, which is a key requirement during AICTE approvals and inspections
- Simulator-based training, field operations, and documented student logbooks ensure alignment with AICTE's model curriculum and experiential learning mandates
- Industry internships and certification programs support AICTE's Internship Policy and employability objectives
- Structured Faculty Development Programs (FDPs) and technical training contribute to UGC audit requirements
- The establishment of UAV, AI, and cyber-physical system laboratories demonstrates institutional readiness in emerging technologies as prescribed under AICTE quality parameters

Table 6.1: UGC and AICTE Compliance Mapping

Sl. No.	Regulatory Body	Regulation / Guideline Focus	Evidence Generated through Drone CoE	Accreditation / Audit Use
A1.1	AICTE	Industry– Academia Collaboration	Jointly governed Drone CoE, MoU, activity reports	AICTE Approval & Inspection
A1.2	AICTE	Experiential Learning	Simulator training, field operations, logbooks	AICTE Model Curriculum
A1.3	AICTE	Internship & Employability	Industry internships, certificates	AICTE Internship Policy
A1.4	UGC	Faculty Skill Development	FDPs, training certificates	UGC Audit
A1.5	AICTE	Emerging Technologies	UAVs, AI, CPS labs	AICTE Quality Parameters

The outcomes under this clause strengthen institutional compliance during AICTE approvals, inspections, and UGC audits.

6.2 NAAC Accreditation Mapping

The Drone Centre of Excellence contributes comprehensively to the NAAC college-level accreditation framework by generating verifiable evidence across all seven criteria.

Criterion-wise Contributions:

- Criterion I: Curriculum enrichment through value-added UAV and emerging technology courses approved by statutory academic bodies
- Criterion II: Simulator-based and field-oriented teaching–learning practices
- Criterion III: Sponsored research projects, patent filings, and consultancy activities
- Criterion IV: Advanced drone laboratories and simulators infrastructure
- Criterion V: Student certifications, internships, and placement outcomes
- Criterion VI: Strategic industry collaboration through formal MoU
- Criterion VII: Sustainability-focused drone applications

Table 6.2: NAAC Criterion-wise Impact Mapping

NAAC Criterion	Sub-Aspect	Contribution through Drone CoE	Documentary Evidence
Criterion I	Curriculum Design	Value-added UAV courses	Syllabus, BOS minutes
Criterion II	Teaching–Learning	Simulator & field-based pedagogy	Training schedules
Criterion III	Research & Innovation	Sponsored projects, patents	MoUs, IPR filings
Criterion IV	Infrastructure	Drone labs & simulators	Asset registers
Criterion V	Student Support	Certifications & placements	Offer letters
Criterion VI	Governance Institutional	Strategic industry MoU	Governing body minutes
Criterion VII	Values	Sustainability applications	SDG reports

The activities under this clause provide strong documentary evidence for NAAC Self-Study Reports and support institutional quality enhancement.

6.3 NBA Accreditation and Program Outcome Mapping

The Drone Centre of Excellence strengthens Outcome-Based Education (OBE) as prescribed by the National Board of Accreditation (NBA) by enabling measurable attainment of Program Outcomes (POs).

Program Outcome Contributions:

- PO1 & PO3: Students apply core engineering knowledge through UAV system design and development activities
- PO4: Investigative skills and data-driven analysis enhanced through analytics, surveys, and technical documentation
- PO5: Exposure to simulators, AI software, and modern engineering tools
- PO7: Sustainability-oriented drone applications

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- PO10: Multidisciplinary team-based projects enhance teamwork and communication skills
- PO12: Participation in certifications, FDPs, and continuous skill development activities promotes lifelong learning

Table 6.3: NBA Program Outcome and Graduate Attribute Mapping

NBA PO	Description	Drone CoE Contribution	Measurable Outcome
PO1	Engineering Knowledge	UAV system design	Lab assessments
PO3	Design Solutions	Drone-based applications	Project reports
PO4	Investigation	Data analytics & surveys	Technical papers
PO5	Modern Tools	Simulators, AI software	Tool usage logs
PO7	Sustainability	Environmental monitoring	Case studies
PO10	Teamwork	Multi-disciplinary teams	Evaluation rubrics
PO12	Lifelong Learning	Certifications & FDPs	Completion records

The outcomes under this clause support NBA Self-Assessment Reports and demonstrate measurable PO attainment.

6.4 NIRF Ranking Framework Contribution

The Drone Centre of Excellence contributes to multiple parameters of the National Institutional Ranking Framework (NIRF) in the college category.

NIRF Parameter Contributions:

- Teaching, Learning and Resources (TLR): Industry trainers, advanced laboratories, and structured FDPs
- Research and Professional Practice (RP): Research publications, patents, and applied projects
- Graduation Outcomes (GO): Student employability, internships, and placement outcomes
- Outreach and Inclusivity (OI): Inter-college training programs and outreach initiatives
- Perception (PR): Increased visibility through innovation activities, collaborations, and media coverage

Table 6.4: NIRF Parameter Contribution Mapping

NIRF Parameter	Indicator	Drone CoE Contribution	Evidence
TLR	Faculty & Labs	Industry trainers & labs	Appointment letters
RP	Research Output	Papers, patents	Publications
GO	Placement	UAV-skilled graduates	Placement data
OI	Outreach	Inter-college programs	Participation records
PR	Perception	National visibility	Media & rankings

The activities under this clause support institutional ranking submissions and performance justification.

6.5 DGCA and National Skill Ecosystem Alignment

The Drone Centre of Excellence establishes alignment with the Directorate General of Civil Aviation (DGCA) and national skill development frameworks.

Key Alignments:

- DGCA-aligned training modules familiarize students with drone rules, operational procedures, and safety norms
- Integration with Skill India initiatives
- Alignment with the National Skills Qualifications Framework (NSQF)
- Enhanced institutional role in developing a skilled workforce aligned with national aviation and technology ecosystems

Table 6.5: DGCA and Skill Alignment

Area	Alignment Aspect	Institutional Benefit	Proof
Training	DGCA-compliant modules	Regulatory readiness	Curriculum
Safety	Drone rules awareness	Compliance culture	Training logs
Skills	NSQF alignment	National recognition	Certificates

This clause supports CMRTC's long-term objective of participating in nationally recognized skill ecosystems.

6.6 United Nations Sustainable Development Goals Mapping

The Drone Centre of Excellence contributes to CMRTC's commitment to the United Nations Sustainable Development Goals (SDGs) through practical and socially relevant applications of drone technology.

SDG Contributions:

- SDG 4 (Quality Education): Experiential learning initiatives
- SDG 8 (Decent Work and Economic Growth): Skill-based training and employability outcomes
- SDG 9 (Industry, Innovation and Infrastructure): Research and innovation activities
- SDG 11 (Sustainable Cities): Smart city surveillance and urban monitoring
- SDG 13 (Climate Action): Environmental monitoring and disaster response
- SDG 15 (Life on Land): Precision agriculture applications

Table 6.6: UN Sustainable Development Goals Mapping

SDG	Focus Area	Drone CoE Application	NAAC Criterion
SDG 4	Quality Education	Experiential learning	Criterion I & II
SDG 8	Employment	Skill-based training	Criterion V
SDG 9	Innovation	UAV R&D	Criterion III
SDG 11	Smart Cities	Surveillance & mapping	Criterion VII
SDG 13	Climate Action	Disaster monitoring	Criterion VII
SDG 15	Agriculture	Precision farming	Criterion VII

The outcomes under this clause support sustainability reporting and NAAC Criterion VII documentation.

6.7 Industry Mentorship, Research and Commercialization

The Drone Centre of Excellence enables structured research, innovation, and commercialization pathways within CMRTC.

Key Outcomes:

- Industry-mentored projects providing real-world problem-solving experience
- Startup incubation and entrepreneurship initiatives fostering innovation culture
- Patent filing and intellectual property generation
- Consultancy and applied R&D activities generating research income
- Strengthened research profile supporting accreditation and ranking

Table 6.7: Mentorship and Research Outcomes

Activity	Output	Institutional Impact	Accreditation Use
Industry Projects	Live problem-solving	Employability	NAAC / NBA
Startups	Incubation	Entrepreneurship	NIRF
Patents	IPR filings	Revenue & ranking	NAAC / RP
Consultancy	R&D income	Research impact	NIRF

The outcomes under this clause strengthen CMRTC's research profile and innovation ecosystem.

6.8 MSME (Ministry of Micro, Small and Medium Enterprises) Alignment and Benefits

The establishment of the Drone Centre of Excellence (CoE) in collaboration with Flydronics Solutions Pvt. Ltd., an MSME-registered enterprise, provides significant academic, research, innovation, funding, and commercialization advantages to CMRTC.

6.8.1 Strategic Advantages of MSME Collaboration

The Drone CoE supported by an MSME partner enables:

- Access to MSME-sponsored and co-funded R&D projects
- Industry-backed product development and prototyping
- Student and faculty participation in MSME innovation schemes
- Enhanced credibility for startup incubation and technology commercialization
- Strong documentation for NAAC, NIRF, and NBA assessments
- Direct industry pipeline from academic research to market-ready drone solutions

Table 6.8: MSME Policy and Institutional Impact Mapping

Sl. No.	MSME Focus Area	Contribution through Drone CoE	Institutional Benefit	Accreditation / Ranking Use
M1	Industry– Academia Collaboration	MSME-led Drone CoE with formal MoU	Strong industry linkage	NAAC Criterion VI
M2	R&D and Innovation	Joint R&D, prototyping, testing	Research output & patents	NAAC Criterion III
M3	Startup & Incubation	Drone startups, MSME vendor ecosystem	Entrepreneurship culture	NIRF – Innovation
M4	Skill Development	Industry-certified MSME training	Job-ready graduates	NAAC Criterion V
M5	Make-in-India	Indigenous drone design & assembly	National relevance	NAAC Criterion VII
M6	Funding Eligibility	MSME-linked grants & CSR projects	Research funding inflow	NIRF – RP
M7	Commercialization	Product pilots & consultancy	Revenue generation	NAAC / NIRF

6.8.2 MSME Schemes and Funding Enablement

The MSME-aligned Drone CoE enables participation in multiple central and state government schemes, including:

- MSME Innovation and R&D Programs
- Technology Development and Commercialization Schemes
- Startup India and MSME Incubation Programs

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- State and Central Government Sponsored Projects
- CSR-funded technology deployment initiatives

Application Domains: Agriculture, smart cities, disaster management, infrastructure monitoring, and surveillance.

6.8.3 Student, Faculty, and Institutional Impact

Through MSME collaboration:

- Students gain exposure to real-world MSME problem statements
- Faculty receive opportunities for consultancy, sponsored research, and product development
- Projects can be converted into patents, startups, or commercial solutions
- CMRTC builds a sustainable innovation and revenue ecosystem

6.8.4 Long-Term Institutional Value

The MSME-backed Drone Centre of Excellence positions CMRTC as:

- A regional hub for drone innovation
- A preferred partner for government and industry projects
- A contributor to national technology missions
- A leader in applied research and skill development

This clause significantly strengthens NAAC SSR documentation, NBA SARs, and NIRF data submissions, while enabling long-term academic and financial sustainability.

7. ACADEMIC AND CAREER IMPACT

The collaboration under this Memorandum of Understanding shall create a comprehensive academic and professional development ecosystem across multiple engineering and technology domains, with a strong emphasis on industry relevance, applied research, and innovation.

7.1 Academic Advancement

S.No.Academic Initiative Description

1	Interdisciplinary Learning	The Centre of Excellence shall promote interdisciplinary learning across Computer Science and Engineering, Electronic and Communication Engineering, Artificial Intelligence and Machine Learning, Data Science, Internet of Things, Cyber-Physical Systems, Geographical Information Systems, Agriculture Technology, and allied engineering domains. Academic programs shall be enriched through industry-aligned curriculum components covering emerging technologies such as
	Curriculum Enrichment	artificial intelligence, data analytics, embedded systems, robotics, UAV systems, remote sensing, smart infrastructure, and

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S.No.Academic Initiative Description

		automation.
3	Project Execution	The collaboration shall support the execution of minor projects, major projects, capstone projects, hackathons, and innovation challenges based on real-time industry problem statements and live field use cases across multiple domains.
4	Professional Standards	Students shall be guided to undertake industry-oriented projects that conform to professional engineering standards, including requirement analysis, system design, implementation, validation documentation, and deployment readiness.
5	Research Activities	The Centre shall facilitate collaborative research activities involving students, faculty, and industry experts, resulting in the preparation and publication of research papers in peer-reviewed journals and reputed national and international conferences. Structured mentorship shall be provided for converting academic projects into research proposals, scholarly publications, patents, and intellectual property filings, including guidance on research methodology, experimental design, result analysis, and technical writing.
6	Mentorship for IPR	

7.2 Employability and Industry Readiness

S.No.Employability Initiative Description

1	Skill Enhancement	The collaboration shall enhance student employability by imparting practical, industry-relevant skills across software, hardware, and integrated systems domains, including system development, testing, optimization, and deployment.
2	Modern Tools Exposure	Students shall receive hands-on exposure to modern engineering tools, platforms, and industry practices applicable to software development, embedded systems, automation, data-driven systems, and UAV-enabled applications.
3	Certification Pathways	Domain-specific certification pathways, regulatory awareness programs, and compliance-oriented training shall be facilitated wherever applicable, including but not limited to aviation, data protection, and safety standards.

S.No. Employability Initiative Description

4	Real-time Projects	Students shall be engaged in real-time industry projects and field deployments that expose them to practical challenges, performance constraints, and professional workflows followed in industrial environments.
		Internship opportunities, live project engagements, and placement support shall be facilitated with industry partners, startups, research organizations, and enterprises associated with Flydronics Solutions Pvt. Ltd. and its ecosystem partners.
5	Internship & Placement	Each student project shall be supported through continuous technical and research mentorship, ensuring that project outcomes meet industry benchmarks and have the potential for commercialization, publication, or further research development.
6	Continuous Mentorship	

8. FINANCIAL ESTIMATES (FUNDED BY FLYDRONICS)

A. One-Time Setup Cost

Component	Description	Cost (INR)
Drone Equipment	Training Drone customized for learning application, Testing equipment, etc.	₹3,00,000
Drone Flight Simulator	Hardware & software setup for drone simulation along with LMS (Both Offline and Online)	₹3,00,000
Drone Workstations	Mechanical tools, spare parts, multimeter, battery charger, Soldering station, etc.	₹1,00,000
Drone Software Licenses	Pix4D / DroneDeploy / AgisoftMetashape (Annual License)	₹1,00,000
Branding & Interior Setup	CoE sign boards, lab branding, banners, and display setup	₹50,000
Training Materials & Manuals	Student kits, guides, checklists, safety handbooks	₹25,000
Safety Equipment	Fire extinguisher, helmets, vests, first aid kit	₹25,000
Total One-Time Cost		₹9,00,000

B. Annual Recurring Cost (First Year)

Component	Description	Cost (INR)
Trainer & Technical Expert Cost	1 full-time trainer + industry experts for guest lectures	₹6,00,000 (₹50,000/month)
Drone Flight Simulator License	Annual Maintenance of software and cloud services	₹1,00,000
Annual Maintenance	Drone servicing, maintenance & calibration	₹75,000
Consumables	Drone Test Kits, Propellers, batteries, landing gear, SD cards, etc.	₹3,50,000
Workshops/Events	Student activities, drone fest, demo days	₹1,50,000
Travel & Logistics	Field visits, industry exposure, trainer travel	₹50,000
Total Annual Recurring Cost		₹13,25,000

C. Grand Total Investment Summary

Investment Category	Amount (INR)
One-Time Setup Cost	₹9,00,000
Annual Recurring Cost (Year 1)	₹13,25,000
Grand Total Investment by FLYDRONICS	₹22,25,000/-

9. FEES STRUCTURE & MINIMUM ENROLLMENT

9.1 Workshop Structure

Parameter	Details
Workshops per semester	2
Students per workshop	100–120
Fee per student	₹500 (base price)

Note: Final pricing subject to module complexity & equipment usage

9.2 Additional Programs

The pricing of the remaining aspects of the project will be determined professionally based on the number of participating students and the scope of work

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expected.

Program Type	Pricing Mechanism
Certificate Courses	Based on duration and content complexity
Advanced Training Programs	Customized pricing based on specialization
Industry Projects	Project-based costing
Consultancy Services	As per industry standards

10. REVENUE SHARING MODEL

10.1 Revenue Distribution for External Students

For students not belonging to CMR Technical Campus (CMRTC), including students from other colleges, institutions, and external participants:

Party	Revenue Share
FLYDRONICS	75%
CMRTC (Institution)	25%

10.2 Program-wise Revenue Sharing

Program Type	FLYDRONICS Share	CMRTC Share
Semester Courses / Workshops	75%	25%
Government / CSR Projects	Mutual Agreement	Mutual Agreement
Sponsored R&D	Mutual Agreement	Mutual Agreement
Consultancy Services	70%	30%
Certification Programs (External)	75%	25%

10.3 Revenue Settlement Terms

Parameter	Terms
Settlement Period	Quarterly (within 30 days of quarter end)
Invoice Submission	Within 15 days of program completion
Payment Mode	Bank Transfer / NEFT / RTGS

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Parameter	Terms
Tax Applicability	GST as applicable under law

11. AGREEMENT TERMS

11.1 Duration and Renewal

Parameter	Terms
Initial Duration	3 (Three) Years
Commencement Date	Date of signing this MoU
Renewal	Extendable by mutual written consent for additional periods of 2 years each
Review Frequency	Annual review meeting to assess progress

11.2 Certification and Branding

Aspect	Details
Joint Certification	All certifications shall bear logos of both FLYDRONICS and CMRTC
CoE Branding	"Flydronics – Centre for Drone Excellence @ CMR Technical Campus"
Marketing Materials	Joint approval required for all public communications
Media Relations	Coordinated approach for press releases and media coverage

11.3 Commitments

Party	Commitment
CMRTC	Minimum enrollment assurance as per Clause 9.3
CMRTC	Infrastructure provision as per Clause 4
CMRTC	Faculty coordinator and administrative support
FLYDRONICS	Equipment, training, and technical expertise as per Clause 1.1
FLYDRONICS	Investment as per Clause 8
FLYDRONICS	Continuous curriculum updates and industry alignment

11.4 Intellectual Property Rights (IPR)

IPR Aspect	Terms
Ownership	Co-owned based on proportionate contribution

IPR Aspect	Terms
Research	
Outputs	Joint ownership with revenue sharing as mutually agreed
Courseware	Developed content remains property of FLYDRONICS; customized additions co-owned
Patents	Filing costs shared; ownership proportionate to contribution
Publications	Joint authorship where applicable

11.5 Confidentiality

Both Parties agree to maintain confidentiality of:

- Proprietary technical information
- Business processes and methodologies
- Student data and records
- Financial arrangements
- Any information marked as confidential

11.6 Amendment

This MoU may be amended only by written agreement signed by authorized representatives of both Parties.

11.7 Entire Agreement

This MoU constitutes the entire agreement between the Parties and supersedes all prior discussions, negotiations, and agreements.

12. GOVERNANCE STRUCTURE

12.1 Joint Steering Committee

A Joint Steering Committee shall be constituted for overall governance of the Drone CoE:

Role	CMRTC Representative	FLYDRONICS Representative
Chairperson (Rotating)	Principal / Director	CEO / Director
Member	Dean Academics	Head - Training
Member	HoD (Relevant Department)	Technical Lead
Coordinator	Faculty Coordinator	Operations Manager
Secretary	Administrative Officer	Project Coordinator

12.2 Committee Responsibilities

- Strategic direction and policy decisions
- Annual review of MoU implementation
- Dispute resolution at institutional level
- Approval of new programs and initiatives
- Budget review and financial oversight

12.3 Meeting Frequency

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Meeting Type

Steering Committee
Operational Review
Emergency Meetings

Frequency

Quarterly
Monthly
As required

13. REPORTING AND DOCUMENTATION**13.1 Periodic Reports**

Report Type	Frequency	Prepared By
Activity Report	Monthly	FLYDRONICS
Enrollment Report	Semester-wise	CMRTC
Financial Statement	Quarterly	Both Parties
Annual Review Report	Yearly	Joint

13.2 Documentation Requirements

Both Parties shall maintain proper documentation including:

- Attendance records
- Assessment reports
- Certificate issuance register
- Equipment inventory
- Maintenance logs
- Financial records
- MoU compliance evidence

14. CONTACT INFORMATION**14.1 FLYDRONICS Representatives**

Designation	Name	Contact
Primary Contact	_____	Email: _____
		Phone: _____
Technical Contact	_____	Email: _____
		Phone: _____
Administrative Contact	_____	Email: _____
		Phone: _____

14.2 CMRTC Representatives

Designation	Name	Contact
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Designation	Name	Contact
Principal/Director	_____	Email: _____ Phone: _____
Faculty Coordinator	_____	Email: _____ Phone: _____
Administrative Contact	_____	Email: _____ Phone: _____

15. RESEARCH CRITERIA, PROJECT MENTORING, AND INNOVATION OUTCOMES

The Drone Centre of Excellence (CoE) shall serve as a catalyst for research excellence, innovation, and scholarly output at CMR Technical Campus (CMRTC).

This clause establishes a structured framework for research mentoring, project execution, publication support, and intellectual property development, ensuring that academic activities translate into measurable research outcomes aligned with institutional accreditation and ranking objectives.

15.1 OVERVIEW OF RESEARCH FOCUS AREAS

The Centre of Excellence in Drone Technology emphasizes research and development across multiple technical domains to drive innovation in unmanned aerial systems.

15.1.1 Primary Research Domains

Research Domain	Sub-Areas	Strategic Importance
UAV Design & Development	Airframe design, propulsion systems, structural optimization, payload integration	Fundamental to indigenous drone manufacturing capability
Autonomous Systems	Path planning, obstacle avoidance, decision-making algorithms, SLAM	Critical for advanced autonomous operations
AI & Machine Learning	Computer vision, object detection, image processing, deep	Enables intelligent drone applications

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Research Domain	Sub-Areas	Strategic Importance
	learning applications	
Sensor Integration	Multi-sensor fusion, LiDAR, thermal imaging, hyperspectral sensing	Essential for specialized drone applications
Communication Systems	Long-range communication, swarm networking, secure data transmission	Supports coordinated multi-drone operations
Flight Control Systems	Advanced control algorithms, stability systems, fault-tolerant control	Core technology for safe and reliable operations
Power Systems	Battery optimization, solar integration, wireless charging, energy management	Addresses critical endurance limitations
Geospatial Applications	Mapping, surveying, GIS integration, photogrammetry, 3D modeling	High-demand commercial applications
Specialized Applications	Precision agriculture, disaster management, infrastructure inspection	Emerging market opportunities

15.2 RESEARCH PROJECTS

15.2.1 Research Project Categories

Project Category	Description	Typical Duration	Funding Range
Industry-Sponsored Projects	Collaborative R&D projects with industry partners addressing real-world challenges	6–18 months	₹2–10 Lakhs
Government-Funded Projects	Projects funded by AICTE, DST, DRDO, MEITY, SERB, and other government agencies	12–36 months	₹5–50 Lakhs
Institutional Major Projects	Research projects funded internally by CMRTC/Flydronics	6–12 months	₹1–5 Lakhs
Collaborative R&D Projects	Joint research with academic institutions and international partners	12–24 months	Variable

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15.2.2 Major Project Targets (3-Year Timeline)

Project Type	Year 1	Year 2	Year 3	Total
Industry-Sponsored Projects(Collaborative submission)	5	5	5	15
Government-Funded Projects (Proposals Submitted)	5	5	5	15
Institutional Major Projects (Collaborative submission)	5	5	5	15
Collaborative R&D Projects	5	5	5	15
TOTAL MAJOR PROJECTS	20	20	20	60

15.3 TECHNICAL PROJECTS

15.3.1 Mini Project Categories

Project Type	Description	Duration
Interdisciplinary Mini Projects	Projects involving multiple departments and cross-functional teams	8–12 weeks
Hackathon Projects	Short-duration intensive projects during hackathons	24–72 hours
Summer/Winter Projects	Project work during semester breaks under mentorship	4–6 weeks

15.3.2 Mini Project Technical Areas

Technical Domain	Example Project Areas
UAV Systems Design	Drone frame design, propulsion systems, flight controller integration
Embedded Systems & IoT	Sensor integration, flight controller programming, telemetry systems
Artificial Intelligence & ML	Object detection, autonomous navigation, image processing
Data Analytics	Flight data analysis, predictive maintenance, performance optimization
Communication Systems	Drone communication protocols, swarm coordination, remote monitoring

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Technical Domain	Example Project Areas
Geospatial Applications	Mapping, surveying, 3D modeling, precision agriculture
Robotics & Automation	Autonomous drones, swarm robotics, payload delivery systems

15.3.3 Mini Project Targets (Per Year)

Academic Year	Mini Projects	Technical Demonstrations	Student Participation
Year 1	10	10	SUBJECTED TO AVALIBILTY
Year 2	10	10	SUBJECTED TO AVALIBILTY
Year 3	10	10	SUBJECTED TO AVALIBILTY

15.4 HACKATHON MENTORING AND INNOVATION CHALLENGES

15.4.1 Hackathon Categories and Structure

Hackathon Type	Description	Duration	Frequency
Internal Drone Hackathons	Intra-college hackathons focused on drone innovation challenges	24–48 hours	Quarterly
Inter-College Hackathons	Competitive hackathons inviting participation from other institutions	36–72 hours	Bi-annual
Industry-Sponsored Hackathons	Hackathons with real-world problem statements from industry partners	48–72 hours	Annual
National/International Hackathons	Participation in external hackathons (Smart India Hackathon, etc.)	Variable	As scheduled
Theme-Based Innovation Challenges	Focused challenges on specific domains (agriculture, defense, logistics)	1–2 weeks	Semester-wise

15.4.2 Hackathon Mentoring Framework

Mentoring Stage	Activities	Mentor Responsibility
Pre-Hackathon Preparation	Problem understanding, ideation workshops, team formation, skill assessment	Guide students on problem analysis and solution approach

Mentoring Stage	Activities	Mentor Responsibility
Technical Mentoring	Hardware/software guidance, debugging support, architecture review	Provide real-time technical assistance during hackathon
Innovation Coaching	Creative thinking, out-of-box solutions, feasibility analysis	Encourage innovative approaches while ensuring practicality
Presentation Coaching	Pitch preparation, demo readiness, documentation	Train students on effective presentation and storytelling
Post-Hackathon Support	Project refinement, prototype development, publication/patent guidance	Convert hackathon projects into tangible outcomes

15.4.3 Hackathon Mentor Pool

Mentor Category	Source	Role
Technical Mentors	Flydronics Engineers, Industry Experts	Hardware, software, and system integration guidance
Faculty Mentors	CMRTC Faculty Members	Academic guidance and project supervision
Industry Mentors	Partner Companies, Startup Founders	Real-world application insights and industry perspective
Alumni Mentors	Successful Alumni in Drone/Tech Industry	Career guidance and networking support
Peer Mentors	Senior Students with Hackathon Experience	Team coordination and peer-to-peer learning

15.4.4 Hackathon Participation and Outcomes Targets

Hackathon Metric	CRITERIA
Internal Hackathons Organized	
Inter-College Hackathons Hosted	
Industry-Sponsored Hackathons	
Student Teams Participating (Internal)	
Students Participating in External Hackathons	
Awards/Prizes Won in External Hackathons	
Hackathon Projects Converted to Prototypes	
Hackathon Projects Leading to Patents	
Hackathon Projects Leading to Startups	

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15.4.5 Hackathon Support Infrastructure

Support Element	Description	Availability
Dedicated Hackathon Lab	Space equipped with workstations, drone kits, and prototyping tools	24/7 during hackathons
Hardware Kit Library	Pre-configured drone components, sensors, microcontrollers for rapid prototyping	On-demand checkout
Cloud Computing Resources	Access to cloud platforms for AI/ML model training and deployment	Throughout hackathon
Mentor Helpdesk	On-site and virtual mentor availability for real-time guidance	Round-the-clock
Documentation Support	Templates for project reports, presentations, and patent drafts	Pre-provided
Refreshments & Logistics	Food, accommodation (if needed), and logistics support	As per event

15.4.6 National Hackathon Participation Strategy

National Hackathon	Focus Area	Preparation Strategy	Target Teams
Smart India Hackathon (SIH)	Multi-domain including drones	Early problem statement analysis, mock hackathons, intensive mentoring	8–10 teams/year
Toycathon	Innovative toy/drone designs	Design thinking workshops, prototype development	3–5 teams/year
DRDO Hackathons	Defense applications	Specialized training on defense requirements, security protocols	2–3 teams/year
Startup India Challenges	Entrepreneurial solutions	Business model development, pitch training	3–5 teams/year
IEEE/ACM Hackathons	Technical innovation	Technical skill enhancement, research orientation	5–8 teams/year

15.5 RESEARCH PROPOSALS AND FUNDING SUPPORT

15.5.1 Funding Agencies and Schemes

Funding Agency	Scheme/Program	Focus Area
AICTE	Research Promotion Scheme (RPS)	Applied Research
DST	Science and Engineering Research Board (SERB)	Fundamental and Applied Research
MEITY	Technology Development Program	Emerging Technologies, IoT, AI
UGC	Major/Minor Research Projects	Academic Research
MSME	Design Clinic Scheme, Incubation	SME Innovation, Product Development
TSCOST	Research Projects	State-level Research
Industry CSR	Corporate Social Responsibility Projects	Community-focused Drone Applications

15.5.2 Research Proposal Targets (Per Year)

Year	Proposals Submitted	Proposals Expected Sanctioned	Expected Funding
Year 1	4	1–2	₹10–20 Lakhs
Year 2	6	2–3	₹20–40 Lakhs
Year 3	8	3–4	₹30–60 Lakhs

15.6 RESEARCH PUBLICATIONS AND CONFERENCE PARTICIPATION

15.6.1 Publication Categories and Targets

Publication Category	Target Journals/Venues	Year 1	Year 2	Year 3	Total
Scopus-Indexed Journal Papers	Scopus-indexed (Q1–Q4)	3	3	3	9
Web of Science (SCI/ESCI)	SCI/ESCI indexed journals	3	3	3	9

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Publication Category	Target Journals/Venues	Year 1	Year 2	Year 3	Total
International Conference Papers	IEEE, Springer, ACM	10	10	10	30

15.6.2 Publication Quality Standards

Quality Parameter Standard

Originality	Plagiarism as per journal norms
Authorship	Joint authorship between CMRTC faculty/students and Flydronics experts encouraged
Ethical Compliance	Adherence to publication ethics, proper citations, and authorship guidelines
Open Access	Encouragement of open-access publications for wider dissemination

15.7 PATENT FILING AND INTELLECTUAL PROPERTY RIGHTS

15.7.1 Patent Filing Categories

Patent Category	Description	Target (3 Years)
Indian Patents Filed	Patent applications filed with Indian Patent Office	8–10
International Patents (PCT)	Patent Cooperation Treaty applications for select innovations	1–2
Design Patents	Design registrations for drone components and systems	2–3
Copyrights	Copyright registration for software, courseware, and creative works	5–8

15.7.2 Patent Filing Process

Stage	Activities	Timeline
Stage 1: Ideation Capture	Documentation of novel ideas, inventions	Ongoing
Stage 2: Prior Art Search	Comprehensive search of existing patents	2–3 weeks
Stage 3: Patentability Assessment	Evaluation of novelty, non-obviousness, and industrial applicability	1–2 weeks
Stage 4: Drafting	Preparation of provisional or complete specification	3–4 weeks

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Stage	Activities	Timeline
Stage 5: Filing	Submission to Patent Office	1 week
Stage 6: Prosecution	Response to examination reports, hearings	12–36 months
Stage 7: Grant	Patent grant and maintenance	Ongoing

15.7.3 Patent Ownership and Revenue Sharing

Scenario	Ownership	Revenue Sharing
CMRTC-Flydronics Joint Invention	Joint Ownership	As per Clause 11.4
CMRTC Solo Invention (with CoE resources)	CMRTC with acknowledgment	As mutually agreed
Flydronics Solo Invention (developed at CoE)	Flydronics with acknowledgment	As mutually agreed
Student Invention (under mentorship)	Joint or as mutually decided	As per contribution

15.8 RESEARCH AND INNOVATION METRICS DASHBOARD

15.8.1 Key Performance Indicators (KPIs)

KPI Category	Indicator	Measurement Frequency	Target (3 Years)
	Total Research Papers		
Publications	Published	Annual	48
Publications	Scopus-Indexed Papers	Annual	9
Publications	SCI/ESCI Papers	Annual	9
	Conference Papers		
Conferences	Presented	Annual	30
Projects	Major Projects Completed	Annual	DEPENDS

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KPI Category	Indicator	Measurement Frequency	Target (3 Years)
Projects	Mini Projects Completed	Annual	DEPENDS
Patents	Patents Filed	Annual	5
	Research Proposals		
Proposals	Submitted	Annual	60
Hackathons	Hackathons Organized	Annual	DEPENDS
Hackathons	External Hackathon Awards	Annual	DEPENDS
Students	Students Engaged	Annual	3000
	Faculty Involved in		
Faculty	Research	Annual	200+

15.9 RESEARCH COLLABORATION AND NETWORKING

15.9.1 Collaboration Categories

Collaboration Type	Description	Expected Outcomes
Academic Partnerships	MoUs with universities and research institutions for joint research	Joint publications, student/faculty exchange, collaborative projects
Industry Collaboration	Research partnerships with drone and technology companies	Sponsored projects, consultancy, technology transfer
Government Collaboration	Engagement with DRDO, ISRO, and defense organizations	Funded projects, advanced research opportunities
International Collaboration	Partnerships with foreign universities and research labs	Joint publications, exchange programs, collaborative grants

15.9.2 Networking Activities

Activity	Description	Frequency
Research Seminars	Technical seminars by industry experts and researchers	Monthly
Guest Lectures	Lectures by domain experts from academia and industry	Bi-monthly
Research Workshops	Hands-on workshops on research methodology and tools	Semester-wise
Industry Visits	Visits to drone manufacturing and application facilities	Quarterly
Research	Hosting or participating in drone technology	Annual

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Activity Conferences	Description conferences	Frequency
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15.10 STUDENT RESEARCH PROGRAMS

15.10.1 Student Research Programs

Program	Description	Eligibility	Duration
Undergraduate Research Fellowship	Structured research program for meritorious UG students	Year 2-3 UG students	6–12 months
Research Internship	Intensive research internship at Flydronics or partner organizations	Year 3-4 UG students	2–6 months
Summer Research Program	Research projects during summer break	All UG/PG students	6–8 weeks
Project-to-Publication Program	Support for converting academic projects into research papers	Final year UG/PG students	3–6 months
Research Scholar Program	Extended research engagement for exceptional students	Selected students	1–2 years
Hackathon-to-Innovation Program	Converting hackathon projects into full-fledged products/patents	Hackathon winners	3–6 months

15.11 FACULTY RESEARCH DEVELOPMENT

15.11.1 Faculty Development Programs

Program	Description	Frequency
Research Methodology Workshop	Training on research design, methods, and tools	Annual
Technical Writing Workshop	Training on research paper writing and publication	Annual
Patent Filing Workshop	Training on IPR and patent procedures	Bi-annual
Project Proposal Writing Workshop	Training on research proposal development	Annual

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Program	Description	Frequency
Industry Immersion Program	Faculty visits to industry for exposure to real-world problems	Quarterly
Hackathon Mentoring Training	Training faculty to effectively mentor students during hackathons	Annual

15.12 STUDENT OUTCOMES AND ACHIEVEMENTS

15.12.1 Student Recognition and Awards Framework

Recognition Type	Criteria	Award/Benefit
Best Researcher Award	Maximum publications/patents in academic year	Certificate, cash prize, conference sponsorship
Innovation Champion	Best hackathon performance and prototype conversion	Certificate, incubation support, mentorship
Best Mini Project Award	Outstanding mini project with practical application	Certificate, project showcase opportunity
Rising Star Award	Exceptional progress by first-year research participants	Certificate, fast-track to research fellowship
Industry Recognition	Recognition by industry partners for exceptional work	Internship/placement priority, recommendation letters

15.12.2 Student Portfolio Development

Portfolio Element	Description	Support Provided
Research Portfolio	Compilation of research work, publications, and presentations	Template, mentoring, review
Project Portfolio	Documentation of all projects undertaken with outcomes	Documentation guidelines, showcase platform
Skills Portfolio	Record of certifications, skills acquired, and competencies	Skill tracking system, certification support
Innovation Portfolio	Patents, prototypes, hackathon projects, and innovations	IPR support, prototype development assistance
Leadership Portfolio	Event organization, team leadership, mentoring activities	Leadership opportunities, recognition

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15.12.4 Student Skill Enhancement Outcomes

Skill Category	Competency Level	Target Students (3 Years)
Drone Assembly & Integration	Professional	
Flight Operations & Piloting	DGCA Certified	
Embedded Systems Programming	Intermediate to Advanced	
AI/ML for Drone Applications	Intermediate	
GIS & Mapping	Intermediate	
3D Printing & Rapid Prototyping	Intermediate	
Project Management	Basic to Intermediate	
Technical Documentation	Intermediate	
Presentation & Communication	Intermediate to Advanced	

15.13 COMPLIANCE AND MONITORING

15.13.1 Research Ethics and Integrity

Aspect	Guidelines
Research Ethics	All research activities shall adhere to ethical principles including honesty, objectivity, integrity, and respect for intellectual property
Human Subjects Research	Approval from institutional ethics committee required for research involving human participants
Animal Research	Compliance with CPCSEA guidelines for any research involving animals
Environmental Safety	Adherence to safety protocols for drone testing and laboratory activities
Data Management	Proper documentation, storage, and backup of research data

15.13.2 Monitoring and Evaluation

Activity	Frequency	Responsibility
Research Progress Review	Monthly	CoE Coordinator

Activity	Frequency	Responsibility
Publication Quality Check	Per Publication	Review Committee
Patent Filing Review	Per Patent	IPR Committee
Hackathon Outcomes Review	Post-Event	Hackathon Committee
Student Outcomes Tracking	Semester-wise	Placement & Training Cell
Annual Research Audit	Annual	Joint Steering Committee

Flydronics Solutions Pvt. Ltd.	CMR Technical Campus (CMRTC), Hyderabad
Authorized Signatory	Authorized Signatory
Name: K.SRIVATSAV	Name: Dr. A. RAJI REDDY
Designation: Director	Designation: Principal
Signature:  For FLYDRONICS SOLUTIONS PVT. LTD. K. Srivatsav Director	Signature:  Director CMR Technical Campus Kandlakoya (V), Medchal (M&D), Hyderabad, Telangana-501 401.
Date:	Date:
Witness	Witness
Name: M.PAVAN KUMAR REDDY	Name: Dr. DTV DHARMATEE QAD
Designation: R&D HEAD	Designation: Professor & Dean Academics
Signature:  	Signature: 
Date:	Date: