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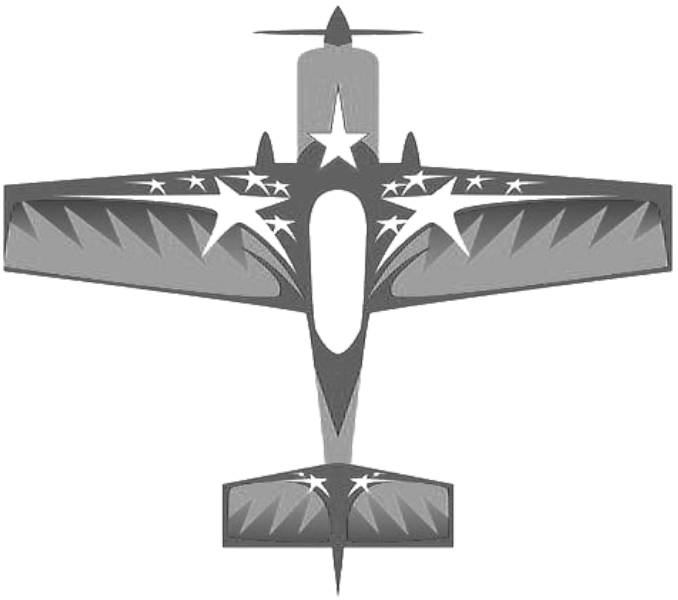

RB-Avionics
University program

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Introduction

Philosophy

RB-Aviation was created by senior engineers who also share a passion for flying. Because we actively use the products we build, our approach is fundamentally different from traditional aerospace companies. We believe in open-source, open design, and transparent engineering to maximize value for pilots and builders.

Instead of closed systems, we offer kits, tools, and SDKs that allow customers to assemble, customize, and improve the aircraft and avionics themselves. This creates a collaborative ecosystem where real users—pilots, engineers, students, and hobbyists—continuously contribute to the evolution of the product.

RB-Aviation is built by people who fly, for people who fly.

Highlights & Benefits

Benefit	Description / Example
Cost-effective learning tools	Using open-source avionics and simulators reduces the need for expensive commercial equipment, making it feasible to train more students on realistic platforms.
Hands-on experience	Students can work directly with hardware and software, including IMUs, GPS, sensors, and displays, gaining practical experience in avionics integration.
Customizable curriculum	Professors can adapt the system to their syllabus, e.g., focusing on aerobatic maneuvers, flight dynamics, or UAV/drone control, without being locked into proprietary solutions.
Simulation-to-real transfer	Students can test algorithms in simulation, then directly deploy them to drones or light aircraft, providing real-world validation of their work.
Research opportunities	Enables research on flight control algorithms, sensor fusion, human-machine interfaces, and flight data analysis at a fraction of traditional costs.
Collaboration and publication	Open-source tools encourage collaboration with other universities and allow publishing of reproducible experiments, increasing academic impact.
Safe experimentation	Simulators and drones allow risk-free testing of aerobatic maneuvers or advanced flight control strategies before applying them in real aircraft.
Innovation and prototyping	Professors and students can prototype new avionics features, such as adaptive displays, autonomous flight modes, or improved navigation systems.

University program

We are pleased to introduce an exciting partnership opportunity designed to connect universities and students with real-world projects across multiple disciplines. Our company operates at the intersection of marketing, legal, and technical innovation, enabling us to host a wide range of internship and thesis topics suitable for students from various academic backgrounds.
Through this collaboration, we aim to:

- Support students in gaining hands-on experience with meaningful, industry-relevant work.
- Build strong ties between academia and industry to foster innovation.
- Contribute to skill development and career readiness for future professionals.

We welcome collaboration with all universities and are committed to providing guided mentorship, structured project frameworks, and access to knowledgeable professionals across our departments.
We would be delighted to discuss how we can tailor this partnership to your institution’s programs and academic goals.

Company profile

RB-Aviation is an innovation-driven company operating at the intersection of aircraft manufacturing, avionics engineering, and advanced flight technologies. Our mission is to design and deliver modern, high-performance solutions for the next generation of pilots, training organizations, and aviation enthusiasts.
Our work spans two main product lines:

1. **Small aerobatic aircraft engineered for precision, performance, and training**
2. **Next-generation glass cockpit avionics designed for safety, usability, and modern flight operations**

Together, these product lines create a fully integrated ecosystem that blends hardware, software, and aeronautical engineering into a unified vision of accessible, modern aviation.

Light aerobatic aircraft

Demo Video: https://www.youtube.com/watch?v=j5OKaiQ8qcE

We are actively developing a family of lightweight, agile, and robust small aircraft optimized for aerobatic training and advanced flight maneuvers. These aircraft are designed using modern materials, aerodynamic modeling, and performance simulation tools to provide:

- High maneuverability for aerobatic performance
- Structural robustness to withstand aerobatic loads
- Optimized weight and balance for responsive flight characteristics
- Safety-first engineering aligned with general aviation standards
- Pilot-focused cockpit ergonomics for training and sport flying

By integrating our avionics technology directly into the aircraft platform, we create a seamless and consistent pilot experience—both in training and during high-precision aerobatic routines.

This product line gives students and researchers a unique environment for studying aircraft design, control systems, aerodynamic simulation, flight testing, safety factors, and structural behavior. It also supports interdisciplinary projects spanning software, hardware, design, and aviation sciences.

Glass Cockpit Avionics

Demo video: https://www.youtube.com/watch?v=UYfrsjpX7aM

Our second major product line focuses on glass cockpit avionics engineered for small aircraft, trainers, ultralights, and experimental aviation. These systems combine cutting-edge sensors, real-time data fusion, synthetic vision, and modern user interface design to enhance pilot situational awareness.

Core features under development include:

- Digital attitude and heading systems (AHRS)
- 3D synthetic vision for terrain and obstacle awareness
- Map navigation and EFB integration
- Engine monitoring and real-time diagnostics
- Traffic Information Service (TIS) and METAR weather data
- Flight data logging and cloud synchronization
- Safety-oriented UI/UX design tailored for turbulence, glare, and cockpit lighting

Our avionics platform is designed with modularity in mind, enabling students and researchers to work on:

- Embedded software
- Communication protocols
- Cybersecurity
- Display systems
- Flight simulation integration
- HMI/UX design
- Machine learning for predictive maintenance
- Hardware prototyping and testing

This ecosystem provides an exceptional foundation for multidisciplinary academic projects.

A Unified Vision

RB-Aviation's aircraft and avionics form a fully integrated system, allowing seamless interaction between physical flight characteristics and digital instruments. This synergy enables:

1. Realistic simulation environments

2. Hardware-in-the-loop testing
3. Data-driven optimization of flight performance
4. Research opportunities across engineering disciplines

By combining the development of airframes and avionics, we offer universities a unique partnership opportunity—one that supports academic exploration while aligning closely with real-world aviation industry needs.

A Platform for Innovation and Collaboration

Our product lines serve as the foundation for the RB-Aviation University Program. Students and researchers can contribute directly to:

- Aircraft modeling and simulation
- Avionics design and implementation
- Human factors and cockpit ergonomics
- Certification research
- AI-based safety systems
- Cloud/data infrastructures
- Marketing and business models for aviation technologies

Through collaboration, we aim to foster a new generation of engineers, pilots, designers, and innovators who will shape the future of modern aviation.

Numbers

Numbers are roughly estimated since the initial rollout of the project June-2025 up to Nov-2025

Aircraft flying	20
Avionics built / flying	400
Builders	100
Countries (percentile)	France, USA, Canada, Germany, UK, Mexico

Contacts

Email	info@xiaprojects.com
Phone	+39 (328) 6141256
Discord	https://discord.gg/G4u6kjmrUG

Audience

Business and marketing

1. Business Schools / Management Faculties
    - Bachelor or Master in Business Administration (BBA, MBA)
    - Master in Management (MiM)
    - Master in International Business
    - Master in Entrepreneurship
2. Marketing & Communication Departments
    - Bachelor or Master in Marketing
    - Strategic Marketing
    - Digital Marketing
    - Consumer Behavior / Market Research
3. Economics Faculties
    - Applied economics
    - Industrial economics
    - Market analysis/econometrics
4. Innovation & Technology Management Programs
    - Technology & Innovation Management
    - Engineering Management
    - Product Management programs
5. Aviation Management Programs
    - Aviation Business Management
    - Airline/Airport Management
    - Aviation Marketing & Economics

Engineering

1. Aerospace engineering
2. Computer engineering / Software engineering
3. Robotics, control systems, UAVs
4. Embedded systems & electronics
5. Aviation management & pilot training
6. Cybersecurity applied to systems & IoT
7. Human–machine interface / design departments

Students competencies

1. Core Competencies Required for All Students

Regardless of specialization, every participating student must have:

1.1 Analytical and Research Skills

- Ability to investigate problems independently
- Literature review and benchmarking capability
- Critical thinking and structured problem solving

1.2 Communication Skills

- Clear written and spoken English
- Ability to prepare reports, documentation, and presentations
- Capability to collaborate with both academic and industry teams

1.3 Project Management & Work Discipline

- Self-organization and planning
- Meet milestones and deadlines
- Document progress regularly (weekly or bi-weekly updates)

1.4 Ethical, Professional, and Confidentiality Standards

- Respect NDAs and data handling policies
- Follow professional communication norms
- Adhere to open-source licensing rules when contributing code

2. Competency Requirements by Thesis Category

- Below is a breakdown for each domain.
- A. Business, Marketing & Management

Suitable University Programs:

- Business Administration (BBA, MBA)
- International Business
- Marketing & Communication
- Economics
- Innovation & Entrepreneurship
- Aviation Management

Required Skills:

- Market analysis, segmentation, and trends
- Competitive research and benchmarking
- Business case modeling (pricing, ROI, costs, TAM/SAM/SOM)
- Surveys, customer interviews, qualitative research
- Data analysis in Excel (Python optional but useful)
- Ability to translate technical features into market insights

Technical Awareness Required:

- Basic understanding of avionics, drones, and aircraft segments
- Awareness of embedded systems & sensor technologies
- Understanding of SaaS/Cloud business models
- Ability to read simple technical specs

B. Software Engineering & Computer Science

Suitable Programs:

- Computer Science
- Software Engineering
- Aerospace Engineering (software-focused)
- Robotics & Automation
- Electrical/Electronic Engineering

Required Skills:

- Depending on the specific thesis:
- Algorithms & Embedded Software (Attitude, RTOS, Sensors)
- C, C++, or Rust development
- Knowledge of IMU, GPS, sensor fusion
- Basic RTOS concepts (FreeRTOS, Zephyr, etc.)
- Navigation, Maps, EFB, and UI/UX
- JavaScript, TypeScript, Swift, or Kotlin
- GIS or map rendering libraries
- Human-machine interface fundamentals
- Cloud, Data Pipelines & IoT
- REST APIs, databases, cloud architecture
- Python, Node.js, or similar backend languages
- MQTT, WebSockets, data streaming concepts
- Machine Learning
- Python, NumPy, SciPy, scikit-learn
- Data pre-processing and model evaluation
- Cybersecurity
- Threat modeling, penetration testing basics
- Secure communication protocols
- Understanding of encryption, authentication, secure boot

C. Hardware, Electronics & Embedded System

Suitable Programs:

- Electrical Engineering
- Electronic Engineering
- Mechatronics
- Aerospace Engineering
- Robotics

Required Skills:

- PCB design (KiCad, Altium)
- Basic analog/digital electronics
- Sensor interfacing (IMU, GPS, pressure, engine sensors)
- Prototype development and testing
- Understanding EMI/EMC principles
- Optional: familiarity with RTCA DO-160
- D. Aviation, Safety & Flight Operations
- Suitable Programs:
- Aerospace/Aeronautical Engineering
- Aviation Technology
- Flight Operations / Aviation Sciences
- Pilot schools (advanced modules)
- Simulator training programs

Required Skills depending on the thesis:

- Aircraft & Drone Modeling
- Flight dynamics
- Aerodynamic modeling
- Simulation frameworks (X-Plane, MSFS, Ardupilot, PX4)
- Flight Training & Situational Awareness
- Aviation procedures (VFR, IFR)
- Autopilot modes and flight deck operations
- Human-factor considerations
- Weather, Traffic, EFB Integration (METAR, TIS, etc.)
- Understanding METAR/TAF/AIRMET/SIGMET

- Awareness of ADS-B and traffic services
- E. Design, HMI, and Cockpit Ergonomics

Suitable Programs:

- Industrial Design
- Interaction Design / UI/UX
- Human Factors Engineering
- Digital Media Design

Required Skills:

- UI/UX software (Figma, Adobe XD, Blender for 3D views)
- Human-machine interaction principles
- Display readability under stress (turbulence, glare)
- Prototyping and mockups
- Optical/lighting considerations for cockpit use
- F. Legal & Certification

Suitable Programs:

- Law (Technology or Business focus)
- Aviation Law
- International Business Law

Required Skills:

- Drafting subscription contracts & service terms
- GDPR and data protection basics
- Understanding liability in aviation use cases
- Awareness of EASA/FAA regulatory environment
- Risk analysis and compliance frameworks

3. Optional but Valuable General Skills

- These are not mandatory but make the student significantly more effective:
- Git/GitHub workflow basics
- Familiarity with Linux environments
- Basic CAD (Fusion360, SolidWorks) for board/part visualization
- MATLAB/Simulink for dynamic modeling
- Experience with simulators (X-Plane, MSFS, ArduPilot SITL)

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Internship and thesis topics

High level description of the major topics, open for discussion to add more.
Table updated on Nov-2025

Aerospace

Id	Deliverables	Subject / Description	Availability
3	Aerospace 1. Aviation case of study 2. Costs and vendors 3. Project plan	Students will explore aviation certification pathways (EASA/FAA), such as DO-160, DO-178, DO-254, and explore how new avionics products can achieve compliance. The thesis includes a case study, cost modelling, vendor evaluation, and a draft certification roadmap for a real product.	Full remote, Worldwide
10	Aerospace 1. Aircraft model and simulator 2. Drone model and simulator	This thesis involves building realistic models of aircraft or drones for simulation use. Students may implement aerodynamic models, flight dynamics, and environmental effects. The models will be tested in simulation frameworks for accuracy and usability.	Full remote, Worldwide
15	Aerospace 1. Using simulator in class 2. Aircraft simulator 3. Situation awareness	Students will explore how flight simulators enhance aviation training. Tasks include designing lesson plans that incorporate simulators, developing simulator exercises, and studying how situational awareness improves with simulation-based training.	Full remote, Worldwide
16	Aerospace 1. Instrumental training 2. Autopilot Patterns	This thesis focuses on IFR training using simulators: navigation procedures, instrument approaches, and autopilot behavior. The student will analyze autopilot modes (NAV, APR, ALT, VS), create exercises, and evaluate training effectiveness for students or pilots.	Full remote, Worldwide
18	Aerospace 1. TIS and METAR Services 2. Integrate into EFB	This thesis focuses on integrating real-time aviation information services into an Electronic Flight Bag (EFB). Students will work with TIS (Traffic Information Service) and METAR/TAF weather data, analyzing data formats, update intervals, and operational relevance for pilots. The project includes designing data ingestion modules, parsing aviation weather/traffic products, and presenting them in a pilot-friendly interface. Additional considerations include latency, offline caching, cybersecurity, and adherence to aviation human-factor guidelines for weather and traffic display. The final goal is a functional prototype that integrates safely and effectively into an existing or newly developed EFB system.	Full remote, Worldwide
21	Aerospace 1. Aircraft industrial production 2. Bill of materials 3. Stocks	Industrialization Strategy for Scaling Production of a 2-Seat Aircraft: BOM Optimization and Stock Management This thesis focuses on defining the industrialization process for bringing an existing 2-seat aircraft from prototype or low-volume production to scalable, repeatable, and cost-efficient manufacturing. The student will analyze and restructure the Bill of Materials (BOM), introduce standardized components, evaluate supplier	Full remote, Worldwide

		strategies, and design a stock and inventory management system suited for aviation-grade production. The work includes production process mapping, identification of manufacturing bottlenecks, cost modeling, quality assurance considerations, and recommendations for establishing a scalable supply chain to support serial production of the aircraft.	
23	Aerospace 1. NACA Study 2. Max TO Weight 3. CG vs Speed	This thesis focuses on the aerodynamic and mass-property foundations of designing a small aerobatic aircraft within RB-Aviation's development program. The student will carry out an in-depth analysis of NACA airfoils, evaluate their suitability for aerobatic performance, and derive the aircraft's CG envelope and maximum take-off weight (MTOW) through engineering calculations and simulation. The work begins with selecting and comparing candidate NACA airfoil profiles (symmetrical and semi-symmetrical) based on aerodynamic properties such as lift coefficient, moment coefficient, stall behavior, and maneuvering capability. CFD tools or XFOIL/XFLR5 may be used to generate performance curves and pressure distributions. The student will then develop the aircraft's mass distribution model, identify critical components, and calculate the CG position, including forward, aft, and aerobatic limits. The thesis includes a detailed assessment of how CG shifts affect stability, control authority, and maneuvering performance. The final part of the project involves determining MTOW through performance, structural, and regulatory constraints. This includes analyzing wing loading, structural margins, takeoff performance, and compliance with general aviation aerobatic requirements. The expected outcome is a well-documented aerodynamic and mass-property study that supports RB-Aviation's ongoing aircraft development. This work directly contributes to performance optimization, flight safety assessment, and early certification planning.	Full remote, Worldwide
24	Aerospace 1. Upgrade from 2 to 4 seats	Thesis Topic: Structural & Performance Redesign for Upgrading a 2-Seat Aircraft to a 4-Seat Configuration Deliverables: 1. Structural analysis and redesign of fuselage and wing 2. Mass distribution & CG envelope update 3. MTOW recalculation and performance impact study 4. Feasibility assessment and certification considerations Description This thesis focuses on the engineering transformation of an existing 2-seat aircraft into a 4-seat configuration, addressing the structural, aerodynamic, and regulatory	Full remote, Worldwide

		implications of such a major redesign. The student will begin by performing a detailed structural analysis of the current airframe, identifying which elements require reinforcement or reengineering to support the increased payload and altered load paths. This includes evaluating fuselage stretch concepts, wing spar strength, landing gear capacity, and overall structural margins. A critical component is updating the aircraft's mass distribution model. The candidate will calculate the new CG envelope, accounting for front and rear passenger positions, luggage compartment, fuel systems, and changed component placements. The study will explore how CG shifts impact stability, control authority, and flight characteristics. The thesis will also include a full recalculation of the Maximum Take-Off Weight (MTOW), analyzing wing loading, stall speed, takeoff and landing distances, powerplant requirements, and performance penalties due to increased mass. Finally, the student will prepare a feasibility and certification impact report, assessing how the redesign aligns with general aviation regulations and structural safety guidelines. The outcome is a comprehensive engineering study that demonstrates whether and how a 2-seat aircraft platform can be safely and efficiently upgraded to a 4-seat configuration—supporting RB-Aviation's strategic roadmap for scalable aircraft development.	
25	Aerospace	Thesis Topic: Aerospace Analysis of Propeller Imbalance and Engine Cylinder Misalignment — Physics-Based Noise Characterization and Practical Balancing Strategies Deliverables: 1. Physics-based analysis of imbalance and misalignment phenomena 2. Signal processing algorithms to identify characteristic vibration/noise signatures 3. Diagnostic plots and real-time detection software 4. Recommendations for minimal onboard hardware to support detection 5. Practical balancing and maintenance strategies based on results Description This thesis investigates the aerospace physics behind two major sources of mechanical vibration and noise in small aircraft: propeller imbalance and engine cylinder misalignment. Students will explore how asymmetric mass distribution, aerodynamic irregularities, ignition timing deviations, and mechanical wear generate distinct vibration patterns that influence aircraft performance, pilot comfort, and long-term structural fatigue.	Full remote, Worldwide

		A major component of the work involves characterizing these phenomena using signal processing, extracting frequency-domain and time-domain signatures linked to first-order and second-order harmonics, resonances, and torsional oscillations. Students will develop software tools capable of detecting and visualizing these anomalies using data from minimal hardware—such as a single IMU, accelerometer, or vibration sensor—making the solution suitable for integration into light aircraft or embedded avionics. The project also covers real-world balancing strategies, including mass correction techniques, propeller tracking/alignment procedures, engine timing adjustment, and vibration mitigation practices used in general aviation maintenance. The student will evaluate how software-based diagnostics can support or improve these maintenance workflows. The final output is a physics-driven, software-enabled diagnostic framework that supports early detection, predictive maintenance, and improved safety for small aircraft engines and propeller systems.	

Software / Hardware

Id	Deliverables	Subject / Description	Availability
2	Hardware 1. Hardware PCB design 2. Hardware prototype	This thesis focuses on designing aviation-grade electronics, including PCB schematics, layout, power systems, and sensor interfacing. Students will follow an engineering workflow from concept to prototype, considering EMI, thermal constraints, redundancy, and manufacturability. Prototypes will be tested on avionics benches or embedded systems.	Full remote, Worldwide
4	Software 1. Software design Attitude 2. Communication protocols 3. Safety and safe RT OS	The student will develop or analyze algorithms for real-time attitude estimation (e.g., Madgwick, Kalman, sensor fusion). Additional tasks include designing robust communication protocols (CAN, UART, RS485, MAVLink) and evaluating safe real-time operating systems suitable for aviation (FreeRTOS+Safety, Zephyr, RTEMS).	Full remote, Worldwide
5	Software 1. Map navigation 2. Software update	Students will develop map-based navigation features, including path rendering, geospatial data management, and offline mapping. They will also design secure firmware/software update workflows for embedded avionics systems, focusing on reliability and cybersecurity.	Full remote, Worldwide
6	Software 1. Human Interface design 2. 3D Synthetic View 3. Simulators	This thesis focuses on cockpit UI/UX for pilots. Students will design an ergonomic interface, develop 3D synthetic vision using terrain data, and optionally integrate the display into a simulator for verification. Human-factor considerations are a major component.	Full remote, Worldwide
7	Software 1. Flight Simulator Integration 2. Simulation bench design	Students will integrate avionics with simulators such as X-Plane, MSFS, or custom engines. They will also design a hardware-in-the-loop (HIL) simulation bench for testing sensors, navigation algorithms, and flight displays.	Full remote, Worldwide
8	Hardware 1. Engine monitoring system	The student will design a digital engine monitoring system (EGT/CHT, RPM, oil pressure/temperature). Tasks include sensor interfacing, signal conditioning, hardware architecture, and data validation. The project may include prototype testing on a bench or simulated engine.	Full remote, Full remote, Worldwide
9	Software 1. IoT and Data Upload 2. Data Analysis	Students will design an aviation IoT pipeline: data acquisition from aircraft systems, wireless upload to cloud infrastructure, and analytics for operational insights. Work may include designing dashboards, anomaly detection, or data compression.	Full remote, Worldwide
11	Software 1. Ardupilot integration 2. Drone integration	Students will integrate company avionics or sensors with Ardupilot-based systems (or PX4). Tasks may include communication protocol development, real-time data streaming, or implementing custom flight modes and telemetry.	Full remote, Worldwide
12	Software 1. Cloud and Web Portal	Students will design a scalable cloud solution for aviation data storage, visualization, and real-time operational monitoring. Work includes backend architecture, API	Full remote, Worldwide

	2. Data Pipeline	design, databases, web dashboards, and efficient data pipelines.	
13	Software 1. Machine Learning 2. Predictive Maintenance	Students will apply ML techniques to avionics or flight/engine data to identify patterns, anomalies, or early signs of component degradation. Models may include classification, forecasting, or clustering on sensor datasets to propose predictive maintenance strategies.	Full remote, Worldwide
17	Hardware 1. Failure diagnosis 2. Attuatuator for AP	Students will design diagnostic tools for identifying hardware faults in avionics. A second component includes designing or analyzing actuators used in light-aircraft autopilot systems (servo mechanisms, control linkages, torque calculations, safety redundancy).	Full remote, Worldwide
20	Cybersecurity 1. Threat analysis and risk assessment 2. Secure communication design 3. Penetration testing & vulnerability review 4. Cyber-resilience strategy for avionics	This thesis focuses on cybersecurity for aviation systems, avionics devices, embedded software, and cloud-connected infrastructure. Students will analyze potential attack vectors affecting modern aircraft systems, including sensor spoofing, data injection, firmware tampering, GPS/ADS-B threats, and wireless communication vulnerabilities. The project includes designing secure protocols for data exchange (e.g., TLS, encrypted telemetry, secure update channels), performing vulnerability assessments or penetration tests on embedded hardware or software modules, and evaluating aviation cybersecurity frameworks such as DO-326A / ED-202A. Students will propose a cyber-resilience strategy tailored to general aviation devices or Electronic Flight Bag (EFB) applications, including intrusion detection measures, secure boot workflows, key management, and defense-in-depth architectures. The final result may include prototype implementations, simulations, or tooling demonstrating improved security posture.	Full remote, Worldwide
26	Software 1. Noise proliferation 2. Propeller balance 3. Engine noise	This thesis focuses on developing signal-processing algorithms capable of identifying, isolating, and visualizing acoustic or vibration patterns caused by propeller imbalance and engine cylinder misalignment. The student will analyze time-series data from minimal onboard hardware (e.g., a single IMU, vibration sensor, or microphone) and build software tools to detect characteristic frequencies, harmonics, and anomalies associated with mechanical issues. The final output includes diagnostic plots, real-time detection strategies, and recommendations for the minimal hardware configuration needed for reliable in-flight or ground-based engine health monitoring.	Full remote, Worldwide

Business / Marketing

Id	Deliverables	Subject / Description	Availability
1	Marketing (Avionics) 1. Business case 2. Marketing research	Students will evaluate market opportunities in the general aviation sector, comparing competing avionics, sensors, and software solutions. Activities include developing a data-driven business case, analyzing customer segments (pilots, schools, drone operators), studying trends, and creating a go-to-market strategy. The student will also explore branding, product positioning, and communication channels for a global aviation technology company.	Full Remote, Worldwide
14	Legal 1. Subscription contract 2. Legal aspects	This thesis addresses aviation-related contract and legal frameworks. Students will draft subscription-based service agreements, analyze compliance requirements (GDPR, product liability, warranties), and provide recommendations on risk mitigation for international markets.	Full remote, Worldwide
19	Design 1. Glasscockpit design 2. Turbolence factors 3. Sun glare factors 4. Cockpit design	This thesis explores the multidisciplinary aspects of designing a modern glass cockpit environment. Students will analyze how flight displays are structured, how information is prioritized, and how pilots interact with avionics during both normal and high-workload conditions. A key component is studying the impact of turbulence, vibration, and cockpit motion on display readability, workload, and human-factor considerations. The student will evaluate how turbulence affects pilot perception, button layout, visual anchoring, and scanning patterns in digital displays. Another major topic is sun glare and lighting conditions. The thesis includes research into reflection management, brightness/contrast strategies, polarized surfaces, and optical coatings that improve day/night readability. Finally, the student will propose or prototype an optimized cockpit design—digital or physical—with an emphasis on ergonomics, safety, usability, and compliance with general aviation best practices. This may involve mockups, UI/UX design, light modelling, or simulation-based evaluation of real cockpit conditions.	Full remote, Worldwide
22	Marketing (Aircraft) 1. Business case 2. Marketing research	Students will evaluate market opportunities in the general aviation sector, comparing competing avionics, sensors, and software solutions. Activities include developing a data-driven business case, analyzing customer segments (pilots, schools, drone operators), studying trends, and creating a go-to-market strategy. The student will also explore branding, product positioning, and communication channels for a global aviation technology company.	Full remote, Worldwide

Way of Working

Topic in this chapter

- Collaboration workflow
- Open-source GPLv3 + dual-licensing model
- Intellectual property handling
- GitHub & internal documentation
- NDA and standard collaboration policies
- Best-practice patterns for academic–industry cooperation

The collaboration between the University and the Company is structured to ensure a productive, safe, and mutually beneficial environment. The following principles define how joint internship and thesis activities are conducted.

Collaboration Framework

The Company and the University engage in a structured and transparent partnership. Students work under joint supervision:

- An **academic supervisor** appointed by the University
- An **industry mentor** appointed by the Company

Work progresses through planned milestones, periodic reviews, and continuous communication to ensure academic goals and real-world engineering requirements are both respected.

Licensing Model and Output Ownership

All technical results produced during the collaboration (software, documentation, algorithms, hardware designs, research) follow a **dual-licensing model**:

Open-Source Contribution – GPLv3

Where appropriate, outputs may be released as open-source under the **GNU GPLv3** license. This ensures:

- Transparency and academic reproducibility
- Contribution to the wider research and developer community
- Proper attribution of student work

Dual Licensing for Commercial Use

The Company may adopt a **dual-license model**, allowing commercial integration of the work under a separate proprietary license.
This approach provides:

- Freedom for academic sharing
- Protection of commercial deployment
- Compliance with aviation and industry requirements

Students will always be credited as contributors unless anonymity is requested.

Repositories and Documentation

GitHub Repository

Open-source components will be hosted in a dedicated **GitHub repository** managed by the Company.
Students may:

- Commit code
- Open pull requests
- Write documentation
- Track issues
- Collaborate on branches

Internal Documentation Systems

When results are proprietary or confidential, they will be stored in the Company's internal documentation tools (e.g., Confluence, GitLab, private repositories).
Access will be restricted according to the NDA and internal security policies.

Confidentiality and NDA Requirements

To protect sensitive information, all participants (students and supervisors, when applicable) must sign a **Non-Disclosure Agreement (NDA)** before accessing any internal systems or proprietary material.

The NDA covers:

- Technical specifications
- Business plans
- Certification-related material
- Hardware prototypes
- Source code not intended for open-source release
- Internal testing data
- Vendor and cost information

The Company commits to providing only the information necessary for the student's work while respecting compliance and aviation safety standards.

Intellectual Property and Research Ethics

The cooperation follows standard academic–industry best practices:

- Students retain authorship of their thesis or research.
- The University retains academic rights to evaluate and publish academic content, respecting NDA boundaries.
- The Company retains rights to commercialize or integrate the work under the dual-license model.
- Publications involving confidential information must be reviewed by the Company before release.

This ensures a balance between academic freedom and industry confidentiality.

Data, Cybersecurity, and Safety Policies

During the collaboration:

- Access to Company systems is granted on a least-privilege basis.

- External data transfers require prior approval.
- Aviation-related datasets must be handled according to safety and regulatory guidelines.
- Software developed for avionics must follow secure coding and traceability principles (e.g., DO-178-style good practices).

Communication and Reporting

Students are expected to provide regular project updates, including:

- Weekly or bi-weekly sync meetings
- Milestone reviews
- Documentation of progress, results, and blockers
- Final report and presentation to both University and Company mentors

This ensures alignment, transparency, and project quality.

Final Deliverables

Each collaboration results in:

- A formal thesis or internship report (academic)
- Source code, models, or designs (open-source or proprietary)
- Documentation suitable for Company integration
- A final presentation summarizing outcomes and next steps

Continuity and Long-Term Opportunities

Exceptional students may be invited to:

- Continue the project as a long-term research partnership
- Contribute to ongoing open-source initiatives
- Join the Company for full-time employment or extended internships

The goal is to create a sustainable pipeline of innovation and talent.