Program Profile		
Program	Program name	Design, Development and Fabrication of an Electric Formula-Style Race Car: Country's First Electric Race Car Development Project
	Category	A1

Summary of Program	
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Abstract of Program	The Formula Student Electric Race Car Project is a national-first initiative being undertaken by students of Mechanical and Automobile Engineering at World University of Bangladesh (WUB). The team will design, develop, and fabricate a fully functioning electric race car in compliance with the international Formula Student rulebook. This project represents a comprehensive engineering experience, encompassing CAD modeling, structural analysis, drivetrain integration, electrical systems, and real-world testing. The vehicle will use a single motor rear-wheel-drive layout, a tubular spaceframe chassis, and a Li-ion battery system managed through a custom Battery Management System (BMS). All components, from concept to track-ready prototype, will be executed entirely by students. The goal is to not only compete internationally but also to pioneer project-based learning in Bangladeshi engineering education.

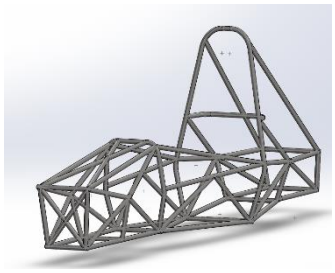
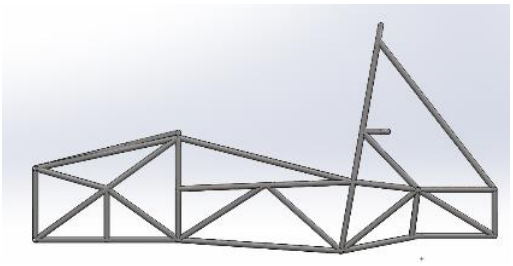
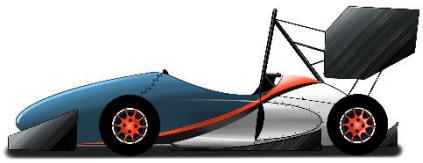
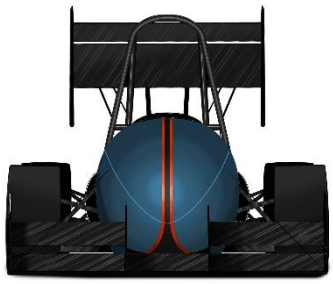
Details of Program		
Planning		
Objectives	Long-term Goals	(Describe the program's long-term objectives over several years.)
	Short-term Targets	The project aims to provide students with industry-relevant skills in electric mobility, mechanical design, embedded systems, and project management. The broader goal is to introduce a new era of engineering education based on performance, research, and teamwork. Key objectives include: - Developing a lightweight, FEM-validated tubular spaceframe chassis. - Designing a high capacity-motor drivetrain for competitive acceleration. - Building a 72V battery pack with in-house developed BMS. - Simulating suspension dynamics and optimizing steering geometry. - Participating in Formula Student events in India and the UK. - Publishing findings in automotive engineering journals and conferences.
	Rationale	As Bangladesh rapidly moves toward adopting electric vehicles and advanced manufacturing, there remains a gap in higher education when it comes to hands-on, interdisciplinary automotive projects. Despite offering a several engineering programs, no Bangladeshi university has yet participated in or developed an Electric Formula Student vehicle. This project emerges as a response to that gap. Inspired by similar competitions in India, the UK, and China, WUB will empower its students to develop a race car from the ground up—designed, built, and tested by students with

		guidance from faculty experts. It will help place WUB at the center of academic innovation in Bangladesh.
Subject (Leader)	Initiator(s)	RAHMAN, Mustafizur.
	Champion(s)	RAHMAN, Mustafizur. (Lead Supervisor) RAHMAN, Md. Hasibur. (Design and Fabrication Supervisor) SAAGOTO, Sadatuzzaman. (Electric Powertrain Supervisor) RIMI, Khairun Nasrin. (Documentation and Publication Supervisor)
	Major team member(s)	SHARIF, Md. Khalid KUMAR, Bishawzit AHMED, Md. Faysal PIASH, Munshi RAHMAN, Nazibur GANI, Fatehaz KHAN, Touhidul Islam
Environment	Nature/Society	This project is completely student-driven, with responsibilities spanning from SolidWorks modeling and component sourcing to welding, electronics integration, and data collection. Faculty will play a supervisory role, ensuring academic alignment and safety. The nature of this project is interdisciplinary, involving aspects of mechanical, automobile, electrical, and control systems engineering, along with budgeting, procurement, and time-bound execution. It provides a real-world platform for students to learn by building.
	Industry/Market	Electric vehicles (EVs), lightweight materials, and sustainable mobility are reshaping the future of transportation. Countries around the world are encouraging academic institutions to partner with industries in developing future-ready engineers. In this context, the Formula Student project is timely and relevant. Bangladesh's own shift toward EV adoption makes this initiative an excellent opportunity for academia to contribute actively. The project aligns with current global trends in: - EV drivetrain innovation - Lightweight structural design - Sustainable racing platforms
Resources	Human resources	This project is going to support teaching and learning methodology of the university therefore 5 (Five) teaching staff are directly involved in the project and a total of 20 (Twenty) students are going to get direct benefit from the project.
	Financial resources	The total financial support required to complete this project is approximately BDT 11,50,000/= (Eleven Lac fifty thousand taka only).

	Technological resources	The project has three parts. - The first part of the project is to design the chassis and the body of the vehicle maintaining Formula Student regulations. - The second stage will be material sourcing and fabrication. - The last part is to assemble the vehicle and test the final product. The following are the requirements to smoothly complete the project: - Strong computers with SolidWorks and Ansys simulation. - 3D printers to analyze the design at a miniature scale for better analysis and evaluation. - A dedicated place to work on the project during university hour. - A racing simulator to train the students how the vehicle will feel at high acceleration and how to maneuver on different tracks. - A proper testing facility or track to test the vehicle in a real-world environment.
Mechanism	Strategy (Weight/Sequence)	As World University of Bangladesh (WUB) embarks on the Formula Student Electric Race Car initiative, several strategic pathways will help maximize the project's sustainability, impact, and reputation. The following options outline how WUB can leverage this project to establish long-term educational and institutional leadership: - Establish a Permanent Formula Student Team - Integrate into an Annual Senior Capstone Program - Forge Industry Partnerships and Sponsorships - Participate in Regional and International Competitions
	Organization	- The program aligns well with WUB's strategic vision of innovation in higher education. - The Automobile Engineering Program directly oversees the project, ensuring integration with academic curricula. - Administrative support channels are available for project facilitation, media outreach, and financial oversight.
	Culture	- WUB's culture of encouraging student-led innovation supports the project strongly. - The presence of the only B.Sc. in Automobile Engineering program in Bangladesh provides a unique platform. - Faculty mentoring culture enhances execution rather than hindering it.
Doing		
Launch date		September 2025
Responsible organization		World University of Bangladesh
Program content and process		The Formula Student Electric Race Car Project is an ambitious, student-led initiative aimed at designing, developing, and fabricating Bangladesh's first Formula Student-style electric race car. The project is fully aligned with the Formula SAE 2025 Rulebook and emphasizes innovation in electric mobility, lightweight chassis design, and advanced suspension systems. Implementation began with a structured process: 1. Conceptualization & Planning – defining objectives, team structure, and compliance with international rules. 2. Design Phase – 3D CAD modeling, chassis and suspension analysis, and drivetrain selection.

	3. Simulation & Validation – FEA for strength, dynamic simulations for suspension and steering, and thermal management studies for the battery system. 4. Fabrication Phase – spaceframe chassis construction, procurement of electric motors, battery modules, and suspension components. 5. Assembly & Testing – integration of subsystems, real-world testing, and tuning for performance and safety. 6. Presentation & Outreach – documentation, media engagement, and preparation for international Formula Student competitions. This phased implementation ensures that students gain exposure to mechanical, electrical, and systems engineering, while also practicing teamwork, project management, and industry-level problem-solving.
Key highlights of the content/process	Content: - First-ever student-built electric race car in Bangladesh. - Alignment with global Formula Student standards. - Hands-on integration of design, fabrication, and testing. Process: - Entirely student-driven under faculty supervision. - Industry sponsorship secured for partial funding. - Structured roadmap from CAD to fabrication.
Differences from traditional approaches	Before: Students had limited real-world exposure beyond classroom theory. Now: Students actively engage in design, fabrication, testing, and industry collaboration, with national media visibility.
Progress as of today	The following progress has been made until today's date: - The tubular chassis has been designed in SolidWorks by the students. - The main body has been designed and analyzed. - Main materials for the chassis have been listed, - Students have gone through the complete rulebook of Formula Student 2025 to build a vehicle that can enter the competition next year.
Problems in implementation	- Due to a lack of funding, the chassis has not yet been assembled and tested. - The motor and battery pack will need to be imported as the performance we are aiming cannot be achieved by the existing motors available in Bangladesh. - All the test will need to be done virtually. With the lack of high-performance computers, this is taking longer than expected.
Approaches to solve the problems	A request has been made for financial support from the university. I am excited to collaborate and conduct research with other national and international universities as well.
Completion date, if completed	It is scheduled to be finished by Q2 of 2026.
Seeing	
Impacts on students	Students will gain unparalleled exposure to real-world engineering practices, improving their skills in CAD, simulation, fabrication, and teamwork. Faculty members will benefit from research opportunities and project mentoring roles.

Impacts on professors	The academic faculty members involved in supervising the project have expressed strong satisfaction with its outcomes. They view the initiative as a practical extension of classroom learning, providing students with an opportunity to translate theoretical knowledge into real-world engineering applications. Faculty members will also benefit through increased engagement in mentoring, research, and interdisciplinary collaboration. Moreover, the project will open new possibilities for academic publications in the areas of electric mobility, lightweight design, and vehicle dynamics, further strengthening the department's academic standing.
Impacts on university administration	The university's leadership, including administrators and the Vice Chancellor, have welcomed the project as a pioneering step that reinforces WUB's unique position as the only institution in Bangladesh offering a B.Sc. in Automobile Engineering. They recognize the initiative as a milestone that will enhance the university's profile, attract media attention, and appeal to prospective students. Leadership has acknowledged the project as not only a learning platform but also a symbol of WUB's forward-looking commitment to innovation, sustainability, and international visibility.
Responses from industry/market	Initial responses from local manufacturers and EV technology firms have been positive, with interest in potential collaboration and sponsorship.
Responses from citizen/government	Given the alignment with national EV policies and Smart Bangladesh initiatives, the project is likely to receive favorable attention from government stakeholders, possibly leading to grants or formal recognition
Measurable output (revenues)	N/A
Measurable input (expenses)	N/A
Cost-benefit analysis for effectiveness	N/A
Future Planning	
Where does the project go from here?	Following completion of the prototype, the project aims to participate in international Formula Student events. Longer-term goals include developing autonomous capabilities, aerodynamic bodywork, and establishing an annual innovation lab at WUB. The project is expected to evolve into a flagship program representing Bangladesh on the global stage.
Addendum	

Exhibits, pictures, diagrams, etc.	The following chassis and body model have been designed as part of this project. We are now awaiting analysis and fabrication.     
Reports, mimeos, monographs, books, etc.	It is expected to publish four Scopus-indexed scientific articles. In addition, a seminar will be conducted to disseminate the experimental results and display the final physical prototype.
Others which may help explain the program (including website links)	A final report will be submitted to the university for record-keeping purposes. The physical prototype will be kept in the university laboratory after the competition.