



## Cover page

Project title: CircuitAcademy

Academic Year: 2024/2025

Group Members:

Department Name: Computer Engineering

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**Project Type** Software

Supervisor Name: Dr.Raed Qadi & Dr.Abdallah Rashed

### Format:

- Single space, Times New Roman.
- 12 pt,
- Maximum 1 page.

### Abstract Body:

#### Items must be provided in the Abstract:

- Why do you think this project is important? Please explain the significance of this Project in brief.
- In your point of view what are the important aspects that should be covered in the project?
- Objective(s): In your view, please explain the main objectives of the project.
- Methodology: Give a brief outline of the application development process.
- Had this project been done before? Are there any similar applications available today?
- **Note:** Please deliver this abstract early to ensure that your Project has been approved by the department's projects committee. **Registration will not be done without this approval.**



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## Project's Abstract:

The Goal of this project is to implement a cross-platform learning platform that helps students better understand circuit and electronics topics such as DC and AC analysis, circuit design, and simulation. We noticed that many students in electrical and computer engineering departments struggle to bridge the gap between theoretical concepts and practical application in circuits courses. This platform addresses that gap by combining interactive learning resources with collaborative tools and a web-based circuit simulator, making electronics education more accessible and engaging.

The significance of this project lies in its focused support for electronics learners. Unlike general e-learning platforms, this system is designed specifically to help users visualize, simulate, and discuss electronics-related problems in real time. It empowers students to learn independently or collaboratively, practice simulations directly in their browser, and reinforce complex topics through live sessions and community discussion.

Key aspects covered in this project include course content centered on electronics and circuit analysis. Community groups and messaging features for peer support. Real-time video meetings for instructor-led sessions. A fully integrated NGSpice-based simulator for hands-on circuit testing with the explanation of analyzing different circuits. And accessibility via both web and mobile platforms.

The main objectives of the project are to provide a user-friendly, interactive platform tailored to circuits and electronics education. Integrate practical simulation capabilities to complement theoretical learning along with a detailed explanation on how to solve different circuits. Foster a collaborative environment through course-based communities, peer-to-peer messaging, and live meetings. Also deliver consistent learning experience across devices.

The platform was developed using Flutter for both web and mobile frontends, enabling cross-platform deployment with a shared codebase. The backend is built with Node.js, and Firebase powers real-time messaging and notifications. Other APIs were used to ensure efficient media and files handling like "Cloudinary" and "SupaBase".

While various learning platforms and online course tools exist, few focus on electronics and circuit simulation in an integrated way. Also, software programs like Multisim or Proteus require installation and lack social or course-based features. By combining simulation, community, and learning management in one platform, this project fills a unique niche and offers a more complete, hands-on learning experience for electronics and circuits students.