كلية الهندسة بشبرا
FACULTY OF ENGINEERING AT SHOUBRA

Communications and Computer Engineering Department Shoubra Faculty of Engineering Benha University

STEREO AUDIO AMPLIFIER PROJECT

1st Year Communications Engineering (2023-2024)

Course : Management of Engineering Project (ELE125)

Supervised by: Eng. Amr Hamed

Written by: Group 5 (Zeyad Bilal – Ahmed Sakr – Zeyad Mohamed – Hassan Sayed – Ashraf Abobakr)

1-Scope

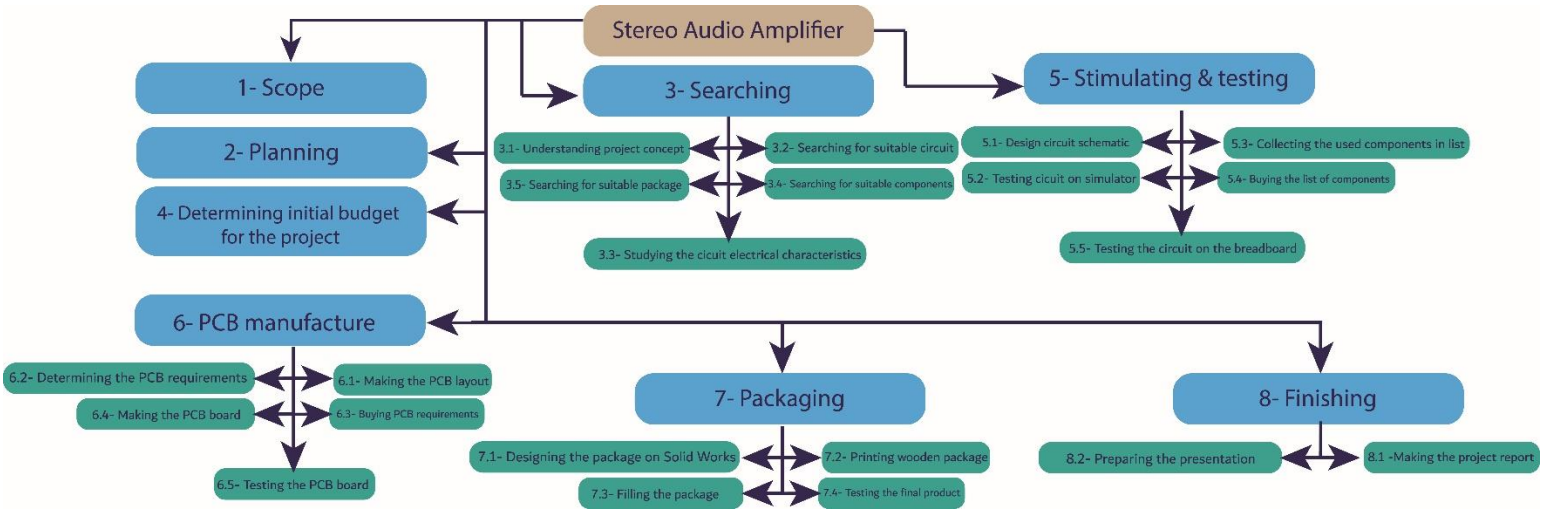
In order to define the scope of the project there are a couple of steps to do:

1. **Design and Planning:** Determine the specifications and requirements for your stereo amplifier project. Consider factors such as power output, impedance matching, distortion levels, frequency response, and the types of audio sources you intend to connect.
2. **Schematic Design:** Develop a detailed schematic diagram based on the block diagram. The schematic represents the electrical connections and components used in the amplifier, such as transistors, capacitors, resistors, and operational amplifiers. Ensure the schematic adheres to proper engineering practices and safety standards.
3. **Component Selection:** Select appropriate components based on the desired performance and budget. This includes choosing transistors for the amplifier stages, capacitors for filtering and coupling, resistors for biasing and impedance matching, and transformers for power supply.
4. **PCB Layout:** Design a printed circuit board (PCB) layout based on the schematic diagram. Ensure proper placement of components, optimal signal routing, and thermal considerations. You can use PCB design software to create the layout or hire a professional if you're not familiar with PCB design.
5. **Prototyping and Assembly:** Build a prototype of the amplifier by soldering components onto the PCB. Double-check the connections, polarities, and orientation of components. Test each stage of the amplifier individually to ensure they work properly.
6. **Testing and Troubleshooting:** Once the amplifier is fully assembled, perform comprehensive testing to evaluate its performance. Use audio signal generators, oscilloscopes, and multimeters to measure characteristics like frequency response, distortion, output power, and signal-to-noise ratio.
7. **Enclosure and Finalization:** Once satisfied with the performance, design or select an appropriate enclosure for the amplifier. Consider aesthetics, heat dissipation, and user interface elements such as input/output connectors, volume controls, and switches.
8. **Final Testing and Evaluation:** Perform a final round of testing to verify the amplifier's performance in its completed form. Ensure it meets the desired specifications and functions reliably under different operating conditions.
9. **Documentation:** Document your project, including the schematic diagram, PCB layout, parts list, assembly instructions, This documentation will be useful for future reference or if you decide to share your work with others.

2-Stakeholders:

NO.	STAKE HOLDERS	CONTRIBUTION
1-	**Students:**	Students are the primary stakeholders in a university project. They are responsible for initiating and executing the project, conducting research, implementing solutions, and presenting the findings.
2-	**Faculty Members/Instructors:**	Faculty members or instructors play a significant role as stakeholders in university projects. They provide guidance to students throughout the project. They may also assess and provide feedback, and grade the project work
3-	**University Administration:**	The university administration They may allocate resources, facilitate project approvals, and ensure compliance with university policies and guidelines. They may also provide support services or funding opportunities for projects aligned with the university's goals.
4-	**Funding Agencies/Sponsors:**	In some cases, university projects may receive funding or sponsorship from external agencies, organizations, or government bodies.
5-	**Suppliers:**	Suppliers of electronic components, such as transistors, capacitors , resistors, and transformers, are stakeholders. They provide the necessary components for the amplifier project

3-WBS Structure:



4-WBS Dictionary:

S.NO	Item	Description
1	WBS identifier	3.4
2	Responsible Team member	Ahmad Sakr
3	Description	Searching for available components
4	Deliverable	Having the right resources for executing the project
5	Duration	3 hrs
6	Starts– Ends	3/12/2024→3/13/2024
7	Resource Required	
8	Budget	
9	Milestones	
10	Risk	

S.NO	Item	Description
1	WBS identifier	6.1
2	Responsible Team member	Ashraf Abobakr
3	Description	Making the PCB Layout
4	Deliverable	The circuit is ready to be manufactured
5	Duration	1 day
6	Starts– Ends	3/21/2024→3/23/2024
7	Resource Required	
8	Budget	
9	Milestones	
10	Risk	

S.NO	Item	Description
1	WBS identifier	1.1
2	Responsible Team member	Hassan
3	Description	Determine the project's scope
4	Deliverable	Now we can set our plans right
5	Duration	2 hrs
6	Starts– Ends	3/31/2024→4/2/2024
7	Resource Required	
8	Budget	
9	Milestones	
10	Risk	

S.NO	ITEM	DESCRIPTION
1	WBS identifier	7.3
2	Responsible Team member	Ziad Bilal
3	Description	Filling the package
4	Deliverable	The product is nearly finished
5	Duration	2 days
6	Starts– Ends	4/3/2024→4/6/2024
7	Resource Required	
8	Budget	
9	Milestones	
10	Risk	

S.NO	Item	Description
1	WBS identifier	8.2
2	Responsible Team member	Ashraf Abobakr , Ahmed Sakr
3	Description	Preparing the presentation
4	Deliverable	Preparing how the project will be presented.
5	Duration	1 day
6	Starts– Ends	4/17/2024→4/17/2024
7	Resource Required	
8	Budget	
9	Milestones	
10	Risk	

6-AOA Diagram: