

# **GUIDELINES FOR INDIVIDUAL PROJECT WORK FOR BASIC ELECTRONICS CIRCUIT TRAINER TEAM MEMBERS**

## **General rules:**

Font size: 12

Font style: New Times Roman

Alignment for write up body: Justify

Line spacing: double except for naming for figure naming and its source (this should be single).

Check page 6 of this doc.

Paragraph: whichever type of paragraph you prefer should be maintained throughout the write-up

**N.B:** no bullet points allowed. Please, use numberings instead. (e.g 1,2,3.... Or i,ii,iii.... Or a,b,c... etc)

## **CHAPTERS:**

### **Chapter One**

#### **Introduction**

(Should be written in this style for all chapters)

#### **1.1 Background of the Study**

The first and second paragraph can be copied and pasted in your work but the third paragraph should be remodeled to bring focus to your specific topic. Please, don't forget to include in-text citations and include the references at the end of the document.

#### **1.2 Research Problem**

You can copy and paste that which is in the general work to your own.

#### **1.3 Aim and Objective of the Study**

You can copy and paste that which is in the general work to your own.

#### **1.4 Significance of the Study**

You can copy and paste that which is in the general work to your own.

#### **1.5 Scope and Limitations of the Study**

Bring the focus to your own work following the pattern in the general work

#### **1.6. Definition of key Concepts**

Define key words and concepts related to your work

#### **1.7 Organization**

You can copy and paste that which is in the general work to your own so long the arrangement tallies with what you hope for yours to look like.

### **Chapter Two**

#### **Literature Review**

#### **2.1 History and Development**

You can copy and paste that which is in the general work to your own, but include here and there your specific work's history and development

#### **2.2 - 2.(any length of your choice)**

Break down your topic completely, explain the all concept from scratch. Include diagrams, equations, and in-text citations.(Please, don't forget to always put the reference to the citation at the end of your document as you work)

## **2.(.....) Review of Related Works**

Review a couple of works that are in relation with your own but make sure none that you are reviewing is better than yours. Include diagrams (if possible the picture of the completed work of similar trainers), and in-text citations. Please, don't forget to always put the reference to the citation at the end of your document as you work.

## **Chapter Three**

### **Materials and Methods**

#### **3.1 Working Principle of the Basic Electronics Circuit Trainer**

This should center around your topic

#### **3.2 Methodology**

You can copy and paste that which is in the general work to your own

##### **3.2.1. Power Supply**

You can copy and paste that which is in the general work to your own

#### **3.2.(...)**

this should be centered on your work

#### **3.3 Block Diagram**

The block here and explanation should be centered around the block pertaining to your work

#### **3.4 Description of Components Used**

You can copy and paste that which is in the general work to your own

## **Chapter Four**

### **Test and Results**

To be continued.....

However, previous works by colleagues can be looked into to get a better understanding of this chapter.

## **Chapter Five**

### **Conclusion**

#### **5.1 Summary**

This should be the summary of your specific project work

#### **5.2 Conclusion**

#### **5.3 Recommendations**

This is how the table of content should look like:

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This is how the equations and numbering the equation should look like:

$$\xi''(\tau) + x_a \alpha''(\tau) + 2\zeta_\xi \frac{\bar{\omega}}{U} \xi' + \left(\frac{\bar{\omega}}{U}\right)^2 F(\xi) = p(\tau) \quad \text{Equation 2.1}$$

$$\frac{x_a}{r_{a\alpha}^2} \xi''(\tau) + \alpha''(\tau) + 2\zeta_\alpha \frac{1}{U} \alpha' + \left(\frac{1}{U}\right)^2 M(\alpha) = r(\tau) \quad \text{Equation 2.2}$$

This is how figure should be named and the in-text citation done, please, notice that the figure naming and the source as only a single line spacing:

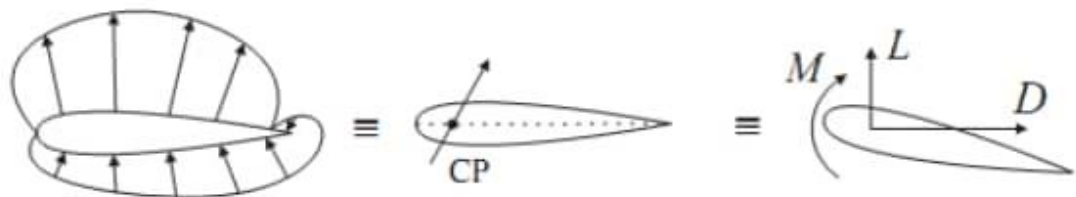
### 2.5.1 Airfoil Nomenclature

The various terms associated with an airfoil are as follows:

- i. Leading edge: It is the forward end of the airfoil that faces the free stream during flight.
- ii. Trailing edge: It is the rearward end of the airfoil.
- iii. Chord line: This is the straight link joining the leading and the trailing ends. It can simply be called chord (Thakur, 2015; Garg and Soni, 2016).

### 2.5.2 Aerodynamic Forces on an Airfoil

A simple illustration of aerodynamic forces can be obtained from the movement of a wing, based only on the modest idea that an airfoil produces an upward force proportional to its angle of attack with respect to the airstream. The position on the chord where the resultant force will have an effect is called the centre of pressure, as shown in Figure 2.5.



**Figure 2.5: Resulting aerodynamic force acting at the centre of pressure.**  
Source: Qiao (2012).

The elements of this force vertical to the path of motion is called lift ( $L$ ) and is mainly the

**This is how the final referencing should:**

**In alphabetical order + the way to use microsoft word feature to accomplish the arranged is shown:**

The image shows a Microsoft Word document with a list of references and the Paragraph dialog box open. The references are listed in alphabetical order:

- Aktakka, E. E. (2012). *Integration of Bulk Piezoelectric Materials Into Microfluidic Devices*. Thesis, University of Michigan, USA, 121p
- Ali, A., Ming, Y., Si T., Iram, S. and Chakraborty, S. (2018). Enhancement of R via firework clustering algorithm validated by ANN. *Information*, 9(60): 1
- Alighanbari, H. (1995). *Flutter Analysis and Chaotic Response of an Airfoil Accounting for Structural Nonlinearities*. PhD Thesis, McGill University, Canada, 25p
- Alper, E. (2009). *Electromechanical Modelling of Piezoelectric Energy Harvesters*. Virginia Polytechnic Institute and State University. United States of America, 160.
- Anderson, J. D. (2001). *Fundamentals of Aerodynamics*. 3<sup>rd</sup> Edition. McGraw Hill, New York, 151 - 304p.
- Ansari, A. R. and Novinzadeh, A. R. B. (2017). Design a control system for an flutter employing gas actuators. *International Journal of Aerospace Engineering*
- Arnau (2004). *Piezoelectric Transducers and Applications*, Springer-Verlag Berlin New York, 2p.
- Arnaud, M., Cyril, T., Oliver, D., Giuseppe, H. and Gaetan, K. (2017). Flutter control of a degree-of-freedom airfoil using a nonlinear tuned vibration absorber. *Computational and Nonlinear Dynamics, American Society of Mechanical Engineers*, 12(5): 1-20
- Arrieta, A. F., Hagedorn, P., Erturk, A., and Inman, D. J. A. (2010). Piezoelectric for nonlinear broadband energy harvesting. *Applied Physics Letters*, 97(10)
- Ayton, L. J. (2016). An analytic solution for gust-aerofoil interaction noise including geometry. *IMA Journal of Applied Mathematics*, (82): 280-304.

The Paragraph dialog box is open, showing the following settings:

- General**
  - Alignment: Justified
  - Outline level: Body Text
  - ☐ Collapsed by default
- Indentation**
  - Left: 0"
  - Right: 0"
  - Special: Hanging
  - By: 0.5"
  - ☐ Mirror indents
- Spacing**
  - Before: 0 pt
  - After: 1 pt
  - Line spacing: Single
  - ☐ Don't add space between paragraphs of the same style
- Preview**
  - Previous Paragraph Previous Paragraph Previous Paragraph Previous Paragraph Previous Paragraph Previous Paragraph Previous Paragraph Previous Paragraph Previous Paragraph Previous Paragraph
  - Alighanbari, H. (1995). *Flutter Analysis and Chaotic Response of an Airfoil Accounting for Structural Nonlinearities*. PhD Thesis, McGill University, Canada, 25p
  - Following Paragraph Following Paragraph Following Paragraph Following Paragraph Following Paragraph Following Paragraph Following Paragraph Following Paragraph Following Paragraph Following Paragraph

The dialog box has buttons for **Tab...**, **Set As Default**, **OK**, and **Cancel**.

For tables in your work, they should look like this:

**Table 2.1: Comparison of different transduction mechanisms of vibration energy harvesters**

| <b>Mechanism</b> | <b>Benefits</b>  | <b>Drawbacks</b>   |
|------------------|--|--|
| Piezoelectric    | <ol style="list-style-type: none"> <li>1. Does not require external voltage</li> <li>2. Voltages between 2 to 10 V</li> <li>3. Simple structure</li> <li>4. No mechanical limitations required</li> <li>5. Compatible with MEMS</li> </ol> | <ol style="list-style-type: none"> <li>1. Poor mechanical characteristics</li> <li>2. Charge leakage</li> <li>3. Small output current</li> </ol>   |
| Electrostatic    | <ol style="list-style-type: none"> <li>1. Simpler to incorporate with electronics and micro-scale system</li> <li>2. Voltage between 2 to 10 V</li> </ol>  | <ol style="list-style-type: none"> <li>1. External voltage source needed</li> <li>2. Mechanical stops needed</li> <li>3. Low output current</li> <li>4. High output impedance</li> </ol>   |
| Electromagnetic  | <ol style="list-style-type: none"> <li>1. No external voltage source.</li> <li>2. No mechanical stops</li> <li>3. High output current</li> <li>4. High output power</li> </ol>   | <ol style="list-style-type: none"> <li>1. Max. Voltage of 0.1V</li> <li>2. Difficult to incorporate with electronics and micro-scale system</li> <li>3. Poor performance in microscale</li> <li>4. Low output voltage</li> <li>5. Bulky in size</li> </ol> |
| Magnetostrictive | <ol style="list-style-type: none"> <li>1. Ultra-high coupling coefficient</li> <li>2. High flexibility</li> <li>3. Suited to high frequency vibration</li> </ol>   | <ol style="list-style-type: none"> <li>1. Non-linear effect</li> <li>2. May need bias magnets</li> <li>3. Difficult to integrate with microsystem</li> </ol>   |

Source: Beeby *et al.* 2010; Kazmierski and Beeby (2011).

For referencing, two guides have been sent. Feel free to get better understanding online.  
Reference format: APA Style

**GOD BLESS US ALL.**