

## Research plan

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### First Stage

**Time Required : 1/6 – 20/7**

- **First Line (BNCT reading and writing):**
  1. Proposal Writing.
  2. General reading and writing about BNCT {only the need to write the proposal and to get a deep and comprehensive view of the topic enough to start writing the research thesis}
- **Second Line (Learning Basics of C++):**
  1. Completion of the first course of C++ basics {variables/data types/flow control/functions/arrays/vectors}
  2. Completion of the second course of C++ basics {Object Oriented Programming OPP\* /Pointers/References/File handling}
  3. Mastering the basics of C++ {Libraries/CMake}

### Second Stage

**Time Required : 20/7 – 30/8**

- **First Line (BNCT reading and writing):**
  1. Proposal Discussion.
  2. Specific reading and writing about BNCT.
  3. Writing the outlines and the introduction of the thesis.
- **Second Line (Simple Simulations using GEANT 4):**

1. Create simple simulation models related to the thesis topic using GEANT 4 {Examples from geant 4 file / Examples on Neutron nucleus interaction / phantom models /Geometry models}.
2. Learn basic databases in GEANT4 {Detector construction / primary Generator / Physicalists / ActionIntialization/Main / CMakelists}.

### Third stage

**Time Required : 30/8 – 30/11**

- **Line Instruction (Building the Actual Model):**
  1. Specific reading and writing about BNCT.
  2. Writing the first section of the thesis and starting the second one.
  3. Start to build the actual real model.
  4. Adding gradually the required and appropriate parameters.

### Fourth Stage

**Time Required : 1/12– 30/1**

- **Line Instruction (Changing the Parameters):**
  1. Finish Writing the second (practical) section of the thesis.
  2. Changing the required parameters .

### Fifth Stage

**Time Required : 1/2– 15/3**

- **Line Instruction (Analyzation of the Results):**
  1. Specific reading and writing about BNCT.

2. Writing the third section of the thesis {Which contains the conclusion/ analysis of simulation results /recommendations/ Linking the study to clinical studies}.
3. Learn the basic methods of analyzation.
4. Learn the softwires required in the analysis process.

### Sixth Stage:

**Time Required : 15/3 – 1/5**

- **Adding and Checking the Last Touches on the Research.**

1. Review with the superviso(Ali Almomani)before the formal defense.
2. Final linguistic and scientific review of the thesis.

- **Discussion .**

#### Note1:

The time is flexible and can change if circumstances change, but the plan remains in the same order in all cases.

#### Note2:

The plan arrangement can be modified to achieve the thesis objectives.

#### Note3:

This plan is general and will necessarily be detailed later for smaller plans.