Chapter1: Introduction:

1. History of particle physics: (1-2 pages) I want to describe a little bit about the history of particle physics, like how it evolved with time, how various discoveries were made to give an overview.
2. Standard Model and theoretical background: (4 page) I move to the theoretical background including various forces, interactions, models. I will describe about Standard model and the theoretical motivation behind it.
3. Beyond the standard model: I will discuss about why there is a need to think beyond the standard model. I will try to give a theoretical base to this. Then I will discuss about the theoretical model of compositeness, how it works, what are the various couplings, forces, lagrangian etc. how excited quarks will couple with ordinary SM particles, what kind of interactions exists etc. etc. I may try to add some knowledge on other popular beyond standard model theories giving more emphasize over compositeness.

Chaper2/3: Detector:

1. Introduction: Why there is a need of such high energy colliders.
2. LHC Basic introduction: (2-3 pages) Its history etc. I will discuss about its various aspects of collider, Give a more details about its various sub parts, its highest magnetic field, how it accerlates protons etc. I can try to add a section similar to the one I added in my literature survey discussing about "a protons journey to maximum energy".
3.Detectors at LHC: I will give an idea of various detectors and there purposes. Then coming to CMS, discussing its various sub detectors etc. Here for CMS, I would like to make a picture from collision, to how various particles goes through the detector, then how these get detected and how then these pass the L1 and HLT levels (online reconstructions) and then finally with various calibrations offline reconstructions, then into different datasets to analysts hands.
I want to discuss about Monte Carlo as it is an important part of analysis process. How MC are made, various assumptions considered, the simulaters like Geant4 etc. I will try to add some information on Geant4 as well. I will think if I should add two chapters on it or including all in one chapter.

Chapter 4: Search of light and heavy flavor quarks in gamma + Jet final state using CMS data at √s = 13 TeV

In this chapter, I will discuss about the every detail of 2016 analysis.
1. Introduction: I will try to give a more theoretical base to this study.
2. Assumptions made, little bit about compositeness model parametes
3. Data and MC samples used: includes signal shapes, cross section etc
4. Event selection: Optimization studies, trigger efficiency study etc.
5. Background parametrization
6. Various studies perfromed like bias study etc.
7. Limit model: some statistics related to how limits are computed
8. Results: information to various related documents etc.

Chapter 5: Other studies

1. Search for exctied state of bottom quarks in gamma + jet final state at √s = 8 TeV
2. Study with 2.7 fb^-1 using 13 TeV collected in 2015
    1. A small introduciton
    2. Data and MC samples
    3. event selection
    4. Various studies perfromed with background functions.

5. Results

Chapter 6: Summary

The flow of thesis should be like:
=> Introduction : q* , b*
=> Accerlator and detector
=> DAQ system and trigger system
=>Simulation
=> Data Analysis: q*, b*
=>Results and summary.