

## CHAPTER III

### OBJECTIVES AND SCOPE OF RESEARCH

#### 3.1 Objectives of this Research

1. To determine a suitable new modified stage-wise superstructure model and solving strategy for a heat exchanger network.
2. To demonstrate the proposed model by determining the best heat exchanger network for a crude distillation unit.

#### 3.2 Scope of Research

##### 3.2.1 Objective 1: To Determine a Suitable New Modified Stage-wise Superstructure Model and Solving Strategy for a Heat Exchanger Network.

A grass-root design for heat exchanger networks will be developed by modifying the original algorithm of stage-wise superstructure model. The modification will include stream splitting, multiple matches per branch and non-isothermal mixing. We also propose a new initialization strategy for generating feasible starting points. Finally, the developed model will be tested and compared the results with other models published in literature.

##### 3.2.2 Objective 2: To Demonstrate the Proposed Model by Determining the Best Heat Exchanger Network Result Compared with Literature.

The grass-root model will be adjusted to determine if the model can obtain the best solution by adding the equations and bounding objective value procedure. The proposed model will be demonstrated by comparing the results with literature to determine if it is the best grass-root model for synthesizing heat exchanger network.