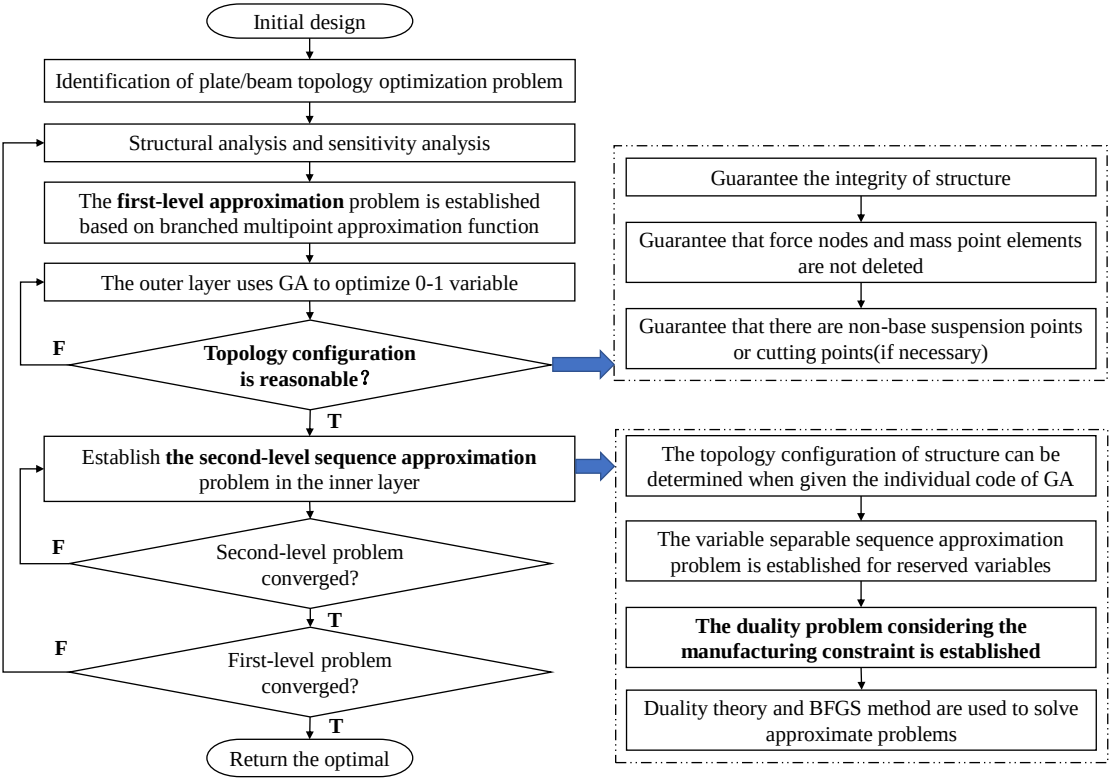
Initial design
Identification of plate/beam topology optimization problem
Structural analysis and sensitivity analysis
The **first-level approximation** problem is established based on branched multipoint approximation function
The outer layer uses GA to optimize 0-1 variable
F
Topology configuration is reasonable?
T
Establish **the second-level sequence approximation** problem in the inner layer
F
Second-level problem converged?
T
F
First-level problem converged?
T
Return the optimal
Guarantee the integrity of structure
Guarantee that force nodes and mass point elements are not deleted
Guarantee that there are non-base suspension points or cutting points(if necessary)
The topology configuration of structure can be determined when given the individual code of GA
The variable separable sequence approximation problem is established for reserved variables
The duality problem considering the manufacturing constraint is established
Duality theory and BFGS method are used to solve approximate problems