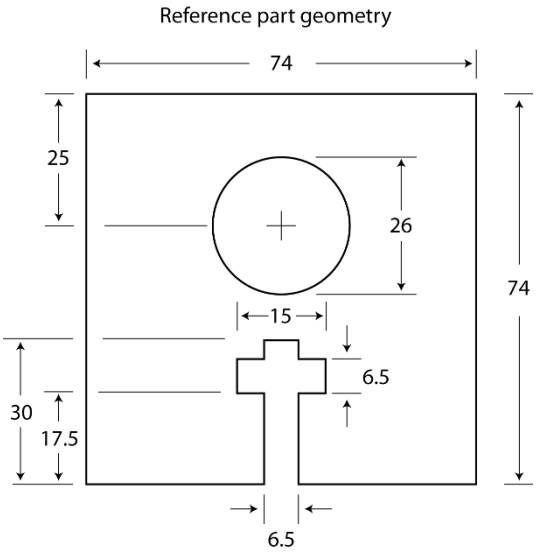
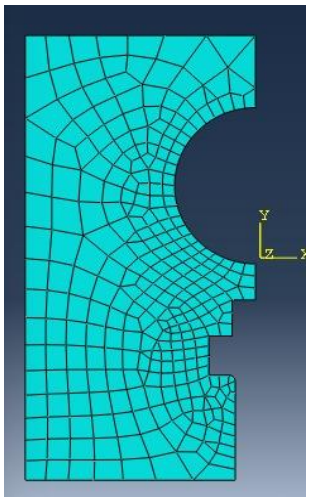
MAE 404/503: Finite Elements in Engineering

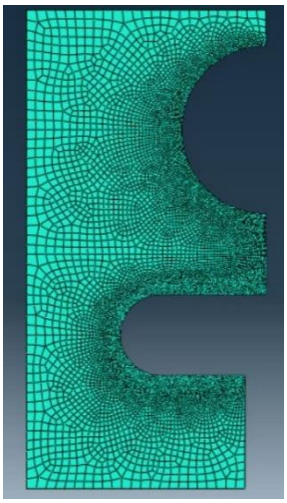
Project 03 – Individual Project

Harshal Rajesh Tingre (ASU ID – 1226039050)

Overview :- This Plate has a nominal thickness of 6.35mm and plate used for this question or this problem 74 ×74 . The material is PMMA (Plexiglas) with properties, Young's Modulus 1800 - 3000 MPa and Poisson Ratio 0.35 - 0.4. This plate is then subjected to a tension test. The modelling and analysis of the component is performed using Abaqus. For this problem one-half symmetry of the component was modeled.







Material Properties: -

The material used for this design Is PMMA with properties assumed to be Young's Modulus 3310 MPa and Poisson Ratio 0.35 – 0.40

Mesh Details:- Nodes: 15804 , Elements: 15686

Element Type: 15115 linear quadrilateral elements of type CPS4R and 471 linear triangular elements of type CPS3

Mesh Refinement Study :-

Mesh	Nodes	Elements	Max. Stress(MPa)	Max. Strain
0.058	5254	4685	32.44	0.01069
0.038	8456	7514	34.08	0.01233
0.019	15658	15999	37.06	0.01856

Assessing the sensitivity to varying load conditions:-

Mesh Size	Load (N)	Max. Stress (MPa)	Max. Strain
0.019	700	54.41	21.33
0.019	900	44.23	18.57
0.019	1100	34.25	15.82
0.019	1300	24.21	12.06