



**INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI  
SHORT ABSTRACT OF THESIS**

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Programme of Study : Ph.D.  
Thesis Title: Nonlinear Time History Analysis of Mass Regular and Irregular Multi-Storey Moment Resisting Steel Frames Using Force Analogy Method  
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**SHORT ABSTRACT**

Building frames constructed in highly seismic zones are vulnerable to severe earthquakes and their susceptibilities to seismic effects are more pronounced if the building frames are 'irregular' in mass (i.e. non-uniform distribution of storey masses along the building height). Irregularity in storey mass may arise due to variation in floor use patterns e.g. residential, parking, commercial/shopping, etc. or due to conversion of existing floor(s) use, for similar requirements. Thus it becomes imperative and pertinent, to conduct detailed seismic analysis of such irregular buildings, before certifying them suitable for use. The detailed seismic analysis has been carried by using the most accurate method of seismic analysis i.e. Nonlinear Time History Analysis using Force Analogy Method (an efficient in computational time algorithm). It has been observed that maximum seismic responses occurred around 40% building height. Further location of mass irregular floor at 40% building height is found to be the most critical.