

Name of Proposer:	Ajanta Sachan
Email	ajanta@iitgn.ac.in
Proposed Areas of research for PhD candidates:	<p>1. Experimental studies related to liquefaction phenomenon, theory behind evaluation of liquefaction potential, and liquefaction induced lateral spreading. A few methods are available to evaluate the liquefaction potential using CPT, SPT and SWV (shear wave velocity) data; however, evaluation of liquefaction induced lateral spreading is still a challenge. As such, the existing methods of liquefaction potential evaluation carry significant amount of subjectivity due to a number of factors involved in it which still need considerable research to generate understanding beyond empirical correlations and evolve more of a generalized approach. This project will further involve learning about the general soil behavior and deformation analysis of gentle slope. This project will be an exciting opportunity for persons interested in working on creative experimental procedures and analyzing the response of liquefied soils under gentle slopes with good learning of soil shear strength behavior.</p> <p>2. Experimental studies related to dynamic behavior of expansive soils to understand the general stress-strain-strength behavior and its influence on the associated structures. As we know, expansive soils swell when they imbibe water and shrink when loose water. It also develops cracks in the structure during the process. This research will focus on the relationship of generated internal forces due to shrink and swell process and the forced induced by the dynamic loading during earthquakes. A person interested in hands-on laboratory work and creative experimental procedures is encouraged for this project.</p>
Required qualification of applicants	BTech in civil engineering w/o MTech and interested in mostly hand-on experimental work and interpretation of response.

Name of Proposer:	Amit Prashant
Email	ap@iitgn.ac.in
Proposed Areas of research for PhD candidates:	<p>1. My research area involves finding design solution to the geotechnical structures, and especially under earthquake loading conditions. Through numerical simulation of earthquake induced effects on geotechnical structures, such as embankments, foundations, retaining walls, the parameters governing the response can be evaluated to generate better understanding of those structures and the design methods/recommendations can be improved accordingly or even evolved from scratch in some cases. The person interested in this work needs to be passionate about generating solutions to build earthquake resistant structures. Working in this area will also involve learning numerical methods (e.g., FEM, etc.) and implementing those through some software programming skills.</p> <p>2. The geotechnical engineering is best understood with a good knowledge of the material behavior involved in it. The soil behavior is relatively complex due to its nonlinear response from a very small strain level, and further complications evolve with pressure dependency, drainage conditions, variability of material constituents, rate of loading, and heterogeneity and anisotropy of soil strata. These complexities have always enticed people to take up the challenge of understanding the reasons behind</p>

	<p>different observed phenomena and simplify those in the form of mathematical formulations for prediction of behavior. These models are then used to simulate various geotechnical problems and develop design procedures. Working in this area will involve good background in soil mechanics and linear algebra. The objective is to understand nonlinear stress-strain behavior of soils including dynamic loading conditions and Instabilities in soils, and to develop appropriate constitutive models with due consideration to such issues.</p> <p>3. Field investigations for liquefaction induced lateral spreading and development of correlations for design purpose. Field investigation with sophisticated and well-equipped equipments can be an exciting experience and it involves a great amount of learning about practical aspects of geotechnical engineering and handling projects. It is indeed an exciting affair to deal with the challenges of working in open fields and managing the project work in a time bound and efficient manner. Besides this unique experience, this project will also involve several measurements, error analysis and interpretations of the collected data.</p>
<p>Required qualification of applicants</p>	<p>BTech in civil engineering w/o MTech with good academic standing and interested in mostly numerical simulation and design work and/or geotechnical field investigations.</p>