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| **Course Title** | G19/102: Fundamentals of Geotechnical Engineering |
| **Duration** | 1 'long day', nominally 0830 to 1930 |
| **Delivery Mode** | FT |
| **Cost** | £335.00 + VAT per delegate |
| **Delegate Nos.** | 3 to 10 |
| **Intended Audience** | • Engineering geologists wanting to develop or refresh their understanding<br>• Civil engineers wanting to refresh their understanding |
| **Objectives** | At the end of this interactive course, delegates should have:<br>• Knowledge of the fundamental composition of soils and how they are classified<br>• Developed a conceptual framework for how soils behave<br>• Knowledge and understanding of the principles of foundation design<br>• Knowledge and understanding of the principles of slope stability assessment |
| **Course Description** | Engineering geologists and civil engineers that do not specialise in geotechnical engineering do not always have a good understanding of how soils behave in principle, which can affect the delivery of their projects. This course aims to develop that core understanding, with limited mathematical treatment of the theoretical basis of the theories.<br><br>The course will be taught through a series of workshops based on the practical application of the basic soil mechanics principles and design equations to examples. To reinforce the learning, delegates will be encouraged to undertake some guided study and answer tutorial questions.<br><br>The focus of the course will be on interactive learning, hence the restriction to small group numbers. The course will comprise 3 sessions within the 'long day':<br><br>1. Fundamental soil characterisation and quantification, leading to discussion around how and why soils behave as they do. This workshop aims to establish the background to the application of the principles to specific engineering issues in the subsequent workshops.<br>2. Foundation design, focussing on the fundamental mechanics before the delegates apply their knowledge to practical examples.<br>3. Stability of soil slopes from a mechanistic approach, with hand calculations to deepen the delegates understanding of how a slope is analysed before the principles of remedial works are explored.<br><br>The tutor will be Dr Andy Goodwin, a chartered engineer with about 30 years' experience in industry and academia. He is a geotechnical specialist, with a thorough knowledge of both the theory and practicalities of geotechnical engineering. |

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| **Indicative Content** | The indicative content comprises:<br><br>Fundamentals & Concepts<br>• Fundamental soil characterisation<br>• Quantification of soils<br>• Total and effective stresses<br>• Conceptual models for strength and compressibility<br>• Fundamentals of how water flows through soils<br>• Tutorial questions<br><br>Foundations<br>• Types of foundation<br>• Failure modes for shallow foundations and piles<br>• Principles of shear failure and bearing capacity theory<br>• Principles of stress distribution and settlements<br>• Principles of shallow foundation design<br>• Principles of pile design<br>• Tutorial questions<br><br>Slope Stability<br>• Types of failure<br>• Effect of material type on the time to failure<br>• Principles of circular slope stability analysis<br>• Introduction to the design of remedial measures<br>• Tutorial questions |