

CV4118 Engineering Geology and Rock Mechanics

[Lectures: 26 hours; Tutorials: 13 hours; Pre-requisites: CV2013; Academic Unit: 3]

Learning Objective

Students can expect to

1. acquire knowledge of principles of geological formation and geological process
2. acquire knowledge of rock mechanics principles, rock properties and failure mechanics
3. learn design and analysis of rock foundation, slopes, and tunnels and rock support

Content

Engineering geology: plate tectonics, minerals, rock types and rock cycle, geological structures, geological maps, geological dating and time scale, geology of Singapore. Rock mechanics: properties of rock materials, rock fractures and rock masses, rock mass classifications, laboratory testing and properties of rocks, design methodology for rock foundations, slopes and tunnels.

Learning Outcome

At the end of the course, students will be able to

1. understand the different geological formations, structures and processes
2. assess rock mechanics properties and select testing methods
3. assess rock mass quality incorporating geological boundary conditions
4. design rock foundations, slopes and excavations, and support

Textbooks/References

- 1 Lutgens, F.K. and Tarbuck, E.J. (2010) Essentials of Geology, 11th Edition. PrenticeHall.
- 2 Blyth, F.G.H. and de Freitas, M.H. (1984) A Geology for Engineers, 7th Edition, Arnold, London.
- 3 Brady, B.H.G. and Brown, E.T. (2004) Rock Mechanics, 3rd Edition. Kluwer Academic Publishers.