



**NANYANG  
TECHNOLOGICAL  
UNIVERSITY**  
SINGAPORE

**School of Civil and  
Environmental Engineering**  
College of Engineering

# List of Pre-approved PG Courses that are available to UG students

Basic Criteria: Year 4 Standing & with Minimum CGPA of 4

## **CV6103 Structural Dynamics (3 AUs)**

Pre-Requisite: Undergraduate structural engineering, or equivalent

Free and forced vibration of single degree of freedom structures; damping; convolution integral; state space method; free and forced vibration of multi-degree of freedom structures; numerical methods; structural response to seismic loading; response spectra; time history analysis and response spectra analysis; special topics.

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## **CV6108 Analysis and Design of Tall Buildings (3 AUs)**

Pre-Requisite: Nil

Philosophy and design criteria of tall buildings; structural systems for tall buildings: moment-resisting frames, shear walls, braced frames; P-Delta effects and instability; structural design process: functional requirements; design criteria and loading: dead, live, wind, and earthquake loads; preliminary and computer-aided proportioning; analysis of tall buildings; very tall buildings including framed tube, tube in tube, trussed tube and hat trusses, etc.

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## **CV6311 Soil Behavior and Engineering Properties (3 AUs)**

Pre-Requisite: CV2013 and CV2014

Physical properties of soils. Hydraulic properties of soils. Compressibility and consolidation behavior of soils. Stress-deformation and shear strength behavior of soils. Measurements of strength, stiffness, compressibility, permeability and consolidation properties of soils by laboratory and in-situ testing methods. Evaluation of design parameters.

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### **CV6312 Slope Stability and Ground Improvement (3 AUs)**

Pre-Requisite: CV2013 and CV2014

Slope stability: shear strength, total and effective stress analyses, methods of slices involving circular and noncircular slip surfaces, slope monitoring and stabilization, case studies. Soil improvement: surface compaction, deep compaction, admixture stabilization, reinforced soil, preloading and vertical drains. Pre-treatment and post-treatment assessment.

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### **CV6313 Shallow and Deep Foundations (3 AUs)**

Pre-Requisite: Nil

Footing and raft foundations: design considerations, bearing capacity, settlement, combined footings, soil-raft interaction analysis, pile-raft foundations. Deep Foundations: response of piles to vertical and horizontal loads, load transfer, dynamic pile testing and static pile load tests.

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### **CV6314 Excavation & Earth Retaining Systems (3 AUs)**

Pre-Requisite: Nil

Retaining structures: Lateral earth pressure, design of earth retention systems, concrete retaining walls, reinforced soil walls and anchored bulkheads. Supported excavation: overview of braced/anchored excavations in soil, evaluation of soil properties, stability of excavations, design of excavation support systems, ground movements associated with excavation, construction monitoring.

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### **CV6315 Engineering Geology and Rock Engineering (3 AUs)**

Pre-Requisite: Nil

Engineering geology: plate tectonics, minerals, rock types and rock cycle, geological structures, rock dating and geological time scale, geological maps, hemispherical projection, geology of Singapore. Rock mechanics: rock mass classifications, laboratory measurements of strength and deformation properties of rocks, failure criteria, shear strength of discontinuities. Applications: rock foundations, stability of rock slopes, underground rock excavations.

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**CV6213 Construction Technology (3 AUs)**

Pre-Requisite: Nil

Green buildings and sustainable construction; Construction safety and legislation; High-rise building construction & precast concrete technology; Bridge construction; Appraisal and repair of structures; Tunnelling & permanent supports; Dredging & land reclamation; Coastal structures; Basement construction.

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**CV6216 Techniques of Project Planning & Control (3 AUs)**

Pre-Requisite: Nil

Techniques for planning and control in managing construction projects; Concepts of network techniques, Resource and cost planning; Operations research methods and Project planning and control.

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**CV6217 Information Technology in Construction (3 AUs)**

Pre-Requisite: Nil

Computerized project management systems; Internet technology; Web applications in construction; Data processing and applications in pricing, tendering, scheduling and cost control system; Simulation of construction operations.

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