The Hong Kong University of Science and Technology

UG Course Syllabus

[Course Title]   Statics

[Course Code]   CIVL2110

[No. of Credits] 3

[Pre-requisites] MATH 1012 Calculus 1A (or any courses on calculus including but may not limited to MATH 1013 Calculus 1B, MATH 1023 Accelerated Calculus I, etc.), PHYS 1111 General Physics I (or any courses on general physics including but may not limited to PHYS 1112 General Physics II, etc.),

[Co-requisites] MATH 1014 Calculus II or MATH 1024 Honors Calculus II

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Course Description

In general, application of Newton's laws to engineering problems; statics of particles; rigid bodies; equivalent systems of forces; equilibrium of rigid bodies; distributed forces; centroids; moments of inertia; analysis of truss & frame structures; axial, shear and bending moment diagrams; friction.

By successfully completing this course, a student would be able to

- Reduce a loaded structure to a model, i.e. creating proper free-body diagrams (FBD) of the structure or the parts in it.
- Examine the stability of this structure, and classify a stable structure as the statically determinate or indeterminate
- Perform static analysis to a statically indeterminate structure, e.g. truss or certain frames
- Calculate and sketch the internal force in a structural member, e.g. axial force, shear force, bending moment.
- Identify the structural analysis that is NOT covered in this course, and what future courses (e.g. mechanics of materials, structural analysis), will cover the relevant topics.

Topics of the course

- Understanding forces and moments
- Equivalent systems of forces and equilibrium
- Stability and static determinacy
- Trusses
- Area properties and moments of inertia
- Internal force diagram
- Static analysis of a structure

Assessments:

Assessment Task	Contribution to Overall Course grade (%)
Assignment and quiz	30%
Mid-term examination	30%
Final examination	40%

Required Texts and Materials

- Hibbeler R.C. "Engineering Mechanics, Statics: 13th edition in SI Units", Pearson Education, 2012. (The "H" in Table 1)

Additional Resources

- Prof. Lambros Katafygiotis's "Mastering Statics" on Coursera (https://www.coursera.org/learn/mastering-statics)