The Hong Kong University of Science and Technology

UG Course Syllabus

[Course Title]	Construction Materials
[Course Code]	CIVL2810
[No. of Credits]	3
[Any pre-/co-requisites]	CIVL 2120

Name: [Instructor(s) Name]	QIU, Jishen
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Course Description

Learning Objectives: On successful completion of this course, students are expected to be able to:

(1) understand basic properties of engineering materials and various factors affecting material behavior;

(2) understand the basis of material tests and correctly interpret the results;

(3) understand the effect of environmental and mechanical actions on the long-term behavior of materials;

(4) specify the appropriate construction material for a given project

(5) make sound engineering judgements when new construction materials or modifications to existing construction materials are proposed.

Topics:

(1) Basic behavior of engineering materials:

General material constituents and states

General material behavior: linear elasticity, plasticity, creep and fracture/fatigue

(2) Concrete science and technology:

(i) properties of cement and aggregates

(ii) cement replacement materials and admixtures

(iii) fresh properties of concrete

(iv) concrete at early age

(v) hardened concrete: strength and deformation behaviour

(vi) concrete durability

(3) Steel:

Types of steel, welding, corrosion protection

(4) Polymer and composites

Classes of polymers, fiber reinforced polymers,

applications in civil engineering

(5) Wood

Wood structure and properties, wood products for structural application

(6) Bituminous pavement materials

Properties of bituminous materials and requirements for pavement construction

Assessments:

Assessment Task	Contribution to Overall Course grade (%)
Homework	25%
Lab Report + Presentation	25%
Final examination	50%

Required Texts and Materials

Domone, P. and Illston, J.M. (2010) "Construction Materials: Their Nature and Behaviour", 4th Edition, Spon Press

Additional Resources

Ashby, M.F. and Jones, D.R.H. (2012) "Engineering Materials 1: An Introduction to Properties, Applications and Design, Volume 1, 4th Edition, Elsevier

Sidney Mindess, J. Francis Young David Darwin (2003) "Concrete", 2nd Ed. Prentice Hall