STRU H1512: Materials

Module Title:	Materials
Language of Instruction:	English

Credits:	5

NFQ Level:	6

Module Delivered In	No Programmes

Teaching & Learning Strategies:	Lectures Practical's Private study

Module Aim:	The aims of the Materials section of this module are: (1) to prepare students for participation in the quality control of materials used in construction projects (2) To give students a basis for further study of material.

Learning Outcomes	
On successful completion of this module the learner should be able to:	
LO1	Describe and examine the (i) source and origin of various engineering materials including aggregates, timber, metals and cement; (ii) physical properties associated with aggregates,cement, timber, metals and fresh and hardened concrete
LO2	Demonstrate an awareness of (i) manufacturing technologies associated with aggregates, cement, concrete timber and metals; (ii) various engineering products available including admixtures etc.
LO3	Demonstrate and understanding of quality assurance of materials.
LO4	Demonstrate the skills developed in: (i) taking and preparation of laboratory samples; (ii) laboratory analysis for properties of materials in accordance with codes of practice including the use of specifically designed engineering testing apparatus; (iii) analysis of laboratory data in accordance with codes of practice and checking conformity of laboratory results with specifications; (iv) preparation of laboratory reports.
LO5	Demonstrate an understanding of Health and Safety in a laboratory environment.

Pre-requisite learning
Module Recommendations *This is prior learning (or a practical skill) that is recommended before enrolment in this module.*
No recommendations listed
Incompatible Modules *These are modules which have learning outcomes that are too similar to the learning outcomes of this module.*
No incompatible modules listed
Co-requisite Modules
No Co-requisite modules listed
Requirements *This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed.*
No requirements listed

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Module Content & Assessment

Indicative Content
(1) Aggregates (13 hours lectures, 6 hours practical) (a) Origin and geological classification of rock. (b) Sources of aggregates. (c) Sampling of aggregates. (i) Sampling (ii) Riffling (iii) Quartering (d) Physical properties and classification of aggregates. (i) Particle size analysis (ii) Fines Content (iii) Flakiness Index Test (iv) Moisture Content (e) Typical Laboratory Experiments Aggregates (i) Sampling (ii) Quartering & Riffling (iii) Particle size analysis (iv) Fines Content Test (v) Flakiness Index Test (vi) Moisture Content
(2) Cement (4 hours lectures, 1 hour practical) (a) Composition, types and manufacturing process. (b) Setting times. (c) Soundness (d) Strength
(3) Introduction To Concrete (10 hours lectures, 6 hours practical) (a) Constituents and mix design (b) Basic Properties of fresh concrete (c) Basic Properties of hardened concrete (d) Typical Laboratory Experiments Concrete (i) Workability – Slump Test (ii) Making Cubes (iii) Curing Cubes (iv) Demoulding Cubes (v) Measuring Cubes (vi) Crushing Cubes
(4) Timber (10 hours lectures, 2 hours practical) (a) Growth and structure of trees (b) Classification of wood (c) Moisture content and seasoning (d) Natural and handling defects (e) Insect and fungal attack (f) Preservation (g) Stress grading (h) Timber products (i) Typical Laboratory Experiments Timber (i) Physical identification and examination of natural wood samples (ii) Physical identification and examination of manufactured board samples (iii) Microscopic examination of hardwood and softwood (slides) structure that is radial, tangential and longitudinal sawn cuts (iv) Moisture content measurement by both Oven and Meter testing (v) Physical examination of defects and deterioration in timber samples (vi) Physical examination and measurement of Knot / Area ratio on timber samples (vii) Physical examination of both Pressure and Brush applied preservative treatments to timber samples
(5) Metals (8 hours lectures, 2 hours practical) (a) Ferrous/non–ferrous (b) Processes, treatments (c) Properties and use (d) Typical Laboratory Experiments (i) Physical identification and examination of various metal samples (ii) Microscopic examination of structure of various metal samples (iii) Metals material testing for Stress and Strain and Hardness tests

Assessment Breakdown	%
Project	100.00%

No Continuous Assessment

Project

Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Project	No Description	1,2,3,4,5	100.00	n/a

No Practical

No End of Module Formal Examination

SETU Carlow Campus reserves the right to alter the nature and timings of assessment

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Module Workload

Workload: Full Time		
Workload Type	*Frequency*	*Average Weekly Learner Workload*
Laboratory	30 Weeks per Stage	0.50
Lecture	30 Weeks per Stage	1.50
Estimated Learner Hours	30 Weeks per Stage	2.00
	Total Hours	120.00