

Subject : Concrete Technology (1)

Class : Second year

Hours : 2hrs (Theoretical), 2hrs (Practical)

Objectives :

The student must learn the physical , mechanical , & chemical characteristics of the main components used in concrete , as well as accomplishing all the related laboratories tests . The student will learn also the characteristics of the fresh concrete & the admixtures of concrete .

Week	Practical Syllabus
1	General information about different types of balances , specifications and experiment reports .
2&3& 4&5& 6&7&8	CEMENT TESTS : Consistency of Cement paste . Initial and final setting times of cement paste . Compressive Strength of cement mortar . Tensile Strength of cement mortar . Soundness of cement (by Autoclave &Le – chatelier method) . Fineness of cement (blain method and by sieving) . Loss of ignition . Scientific visit .
9&10& 11&12& 13&14& 15&16& 17&18	AGGREGATE TESTS : Sampling of coarse and fine aggregate . Unit weight and voids of coarse aggregate . Unit weight and voids of fine aggregate . Sieve analysis of coarse aggregate . Sieve analysis of fine aggregate . Specific gravity and absorption for coarse aggregate . Specific gravity and absorption for fine aggregate . Bulking of sand . Moisture content in coarse and fine aggregate . Los –Angeles abrasion test for coarse aggregate . Materials finer than sieve No. 200 in coarse and fine aggregate . Salt and sulphate content in fine aggregate . Organic material content in fine aggregate . Chloride ion content .
19	Mixing water tests (Sulphates ; Chlorides ; Organic materials ... etc)
20&21& 22&23 &24	Tests related with admixtures and their effects on fresh and hardened concretes .

25&26& 27&28& 29&30	FRESH – CONCRETE TESTS : Measurement of Workability and Consistency : (Slump test ; Compacting Factor test ; Remoulding test ; Vebe test ; Flow test ; Ball –penetration test). Bleeding test ; Unit weight and Air – content tests .
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References:

1. "Properties of Concrete " , A.M.NEVILLE, 3 rd. Ed. , A pitman International Text. (1981) .
2. "Composition and properties of Concrete " , TROXELL , DAVIS , and KELLY , Mc Graw - Hill book Company (1968) .
3. D.F. ORCHARD, "Concrete Technology", Vol. 1,2&3, (1978) .
4. ASTM , BRITISH , and IRAQI specifications for concrete works .
5. د.احمد علي العريان و د. عبد الكريم محمد عطا " تكنولوجيا الخرسانة : مواد الخرسانة المسلحة وصناعتها" ، الجزء الاول ، الطبعة الثانية ، عالم الكتب (1975) .
6. د.كنانة محمد ثابت و د.رياض حامد الدباغ ويوسف عمرو "مبادئ الجيولوجيا الهندسية " ، جامعة الموصل (1979) .