AMITY UNIVERSITY
UTTAR PRADESH

Course Title: CONCRETE TECHNOLOGY

Credit Units:04

Course Code: CEE303

L	T	P/S	SW/FW	TOTAL CREDIT UNITS
03	-	02	-	04

Course Level: UG

Course Objectives: Types of concrete and their manufacture and applications are covered in this course.

Pre-requisites: NIL

Course Contents/Syllabus:

	Weightage (%)
Module I	**25**
Materials Materials: cement - different types - chemical composition and physical properties - tests on cement - I.S. specifications - aggregates - classification - mechanical properties and tests as per I.S. - alkali aggregate reaction - grading requirements - heavy weight - light weight - normal weight - aggregate - sampling of aggregate - water - quality of water - permissible impurities as per I.S - admixtures - accelerators - retarders - water reducing agents – super plasticizers- use of silica fumes	
Module II	**25**
Manufacture Manufacture of concrete - measurement of materials - storage and handling - batching plant and equipment - mixing - types of mixers - transportation of concrete - pumping of concrete - placing of concrete - under water concreting - compaction of concrete - curing of concrete - ready mixed concrete - mix design - nominal mixes - design mixes - factors influencing mix design - A.C.I method - I.S method - design for high strength mixes.	
Module III	**25**
Properties of Concrete Properties of concrete - fresh concrete - workability - factors affecting workability - tests for workability - segregation and bleeding - hardened concrete - factors affecting strength of concrete - strength of concrete in compression, tension and flexure - stress- strain characteristics and elastic properties - shrinkage and creep - durability of concrete - permeability - chemical attack - sulphate attack - resistance to abrasion and cavitaion - resistance to freezing and thawing - resistance to fire - marine atmosphere - quality control - frequency of sampling - test specimens - statistical analysis of test results - standard deviation - acceptance criteria	
Module IV	**25**
Special Concretes Special concrete - light weight concrete - high density concrete - vacuum concrete - shotcrete - Fibre reinforced concrete-polymer concrete - ferrocement - high performance concrete - self compacting concrete - types of failure - diagnosis of distress in concrete - crack control - leak	

proofing - guniting and jacketing techniques	

Student Learning Outcomes:

1. A detailed understanding of composition of various types of concrete
2. A detailed understanding of properties of concrete, various tests performed on concrete
3. An ability to perform concrete mix design
4. An ability to apply the learning for research work

Pedagogy for Course Delivery:

1. Class room teaching supported with field based examples.
2. Use of presentation for enabling better understanding of the subject.
3. Assignments based on industrial application of the theory

List of Experiments:

1. Fineness of cement
2. Normal consistency of cement
3. Initial and final setting times of cement
4. Specific gravity of cement
5. Soundness of cement
6. Fineness modulus of fine and coarse aggregate
7. Specific gravity, void ratio, porosity and bulk density of coarse and fine aggregates
8. Bulking of sand
9. Workability tests on fresh concrete
10. Compaction factor test
11. Test for compressive strength of cement concrete

Assessment/ Examination Scheme:

Theory L/T (%)	Lab/Practical/Studio (%)	Total
75	**25**	**100**

Theory Assessment (L&T):

Continuous Assessment/Internal Assessment					End Term Examination
Components (Drop down)	**A**	**CT**	**S/V/Q**	**HA**	**EE**
Weightage (%)	5	10	8	7	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; A: Attendance

Lab/ Practical/ Studio Assessment:

	Continuous Assessment/Internal Assessment				End Term Examination		
Components (Drop down	**A**	**PR**	**LR**	**V**	**PR**	**V**	**Total**
Weightage (%)	5	10	10	5	35	35	70

Text & References:

- Neville A.M., Properties of Concrete, Pitman
- Shetty M.S., Concrete Technology, S I Chand & Company, 1993.
- Gambhir M.L., Concrete Technology, Tata McGraw Hill, 1995.
- Orchard D.F., Concrete Technology Vol. I & II, 1968.
- Krishna Raju N., Design of Concrete Mixes, CBS publishers, 1988.
- Raina V.K., Concrete for Construction-Facts & Practices, Tata McGraw Hill publishing co. 1988.
- John. H. Bungey, The Testing of Concrete in Structures, Urrey University of Press Hall
- Akroyd T.N.W., Concrete: Properties & Manufacture, Pergamon Press, 1962.
- Murdock L.J., Concrete: Materials & Practice, Edward Arnold, 1968.