

RGPV (DIPLOMA WING) BHOPAL		OBE CURRICULUM FOR THE COURSE		FORMAT-3	Sheet No. 1/5
Branch	Civil Engineering		Semester	5 th	
Course Code	Course Name		Concrete Technology		
Course Outcome 1	Interpret properties of cement, aggregates and water used in concrete.		Teach Hrs.	Marks	
Learning Outcome 1	Describe different properties, types , grades of cement and quality of water.		06	05	
Contents	<p>Physical properties of OPC and PPC: fineness, standard consistency, setting time, soundness, compressive strength. Different grades of OPC and relevant BIS codes.</p> <p>BIS Specifications and field applications of different types of cements: Rapid hardening, Low heat, Portland pozzolana, Sulphate resisting, Blast furnace slag, High Alumina and White cement.</p> <p>Water: Quality of water, impurities in mixing water and permissible limits of solids as per IS: 456</p>				
Method of Assessment	External Theory Exam – Pen Paper Test				
Learning Outcome 2	Describe types and properties of aggregates.		06	05	
Contents	<p>Aggregates: Requirements of good aggregate, Classification according to size and shape.</p> <p>Fine aggregates: Properties, size, specific gravity, bulk density, water absorption and bulking, fineness modulus and grading zone of sand, silt content and their specification as per IS 383. Concept of crushed Sand.</p> <p>Coarse aggregates: Properties, size, shape, surface texture, water absorption, soundness, specific gravity and bulk density, fineness modulus of coarse aggregate, grading of coarse aggregates, crushing value, impact value and abrasion value of coarse aggregates with specifications.</p>				
Method of Assessment	Internal Theory Exam – Part of Mid Semester Test I				
Learning Outcome 3	Perform various tests on cement and aggregates		12		
Contents	<p>Tests on cement -fineness, soundness.</p> <p>Tests on aggregates: Water absorption, fineness modulus, Impact test, Crushing value</p>				
Method of assessment	Practical Exam : Both Internal and External				

Course Outcome 2	Explain different characteristics of concrete.	Teach Hrs.	Marks
Learning Outcome 1	Describe properties and grades of concrete for different exposure conditions.	06	05
Contents	Concrete: Different grades of concrete as per provisions of IS 456. Duff Abraham water cement (w/c) ratio law, significance of w/c ratio, selection of w/c ratio for different grades, maximum w/c ratio for different grades of concrete for different exposure conditions as per IS 456. Curing and its effect on concrete		
Method of Assessment	Internal Theory Exam – Part of Mid Semester Test I		
Learning Outcome 2	Explain significance of properties of fresh and hardened concrete.	08	10
Contents	Properties of fresh concrete: Workability: Factors affecting workability of concrete. Segregation, bleeding and preventive measures. Determination of workability of concrete by slump cone, compaction factor, Vee-Bee Consistometer. Values of workability required for different types of concrete works. Properties of Hardened concrete: Strength, Durability, Impermeability. Factors affecting strength, durability and impermeability.		
Method of Assessment	External Theory Exam – Pen Paper Test		
Learning Outcome 3	Perform tests on concrete and Interpretation of test results.	06	
Contents	Student should Perform following test: 1. Slump cone test 2. Compaction factor test 3. Compressive strength test at different ages .		
Method of Assessment	Practical Exam : Both Internal and External		
Course Outcome 3	Prepare concrete mix of required specification.	Teach Hrs.	Marks
Learning Outcome 1	Explain objective and methods of mix design.	08	10
Contents	Concrete mix design: Objectives, various methods of mix design. Objectives and parameters of mix design, introduction to various grades as per IS:456-2000; proportioning for nominal mix design as prescribed by IS 456-2000. Difference between nominal and controlled concrete.		
Method of Assessment	External Theory Exam – Pen Paper Test		

Learning Outcome 2	Design concrete mix as per IS 10262 .	07	10
Contents	Introduction to IS-10262-2009-Code for controlled mix design. Design of concrete mix of required specifications. Adjustment on site for: Bulking of fine aggregate, water absorption of aggregate, workability. Mix design problems of concrete for desired mix strength or grade.		
Method of Assessment	Internal Theory Exam: Assignments/ Seminars/ Presentations		
Course Outcome 4	Carryout various concreting operations and use admixtures.	Teach Hrs.	Marks
Learning Outcome 1	Explain the sequential operations of concreting in given situation.	10	10
Contents	Concreting Operations: Batching, Mixing, Transportation, Placing, Compaction, Finishing and curing of concrete. Pumping of concrete. Equipments and machineries used in concreting operations.		
Method of Assessment	External Theory Exam – Pen Paper Test		
Learning Outcome 2	Explain the types of form works, their application and identify types of construction joints and defects of concrete.	10	15
Contents	Forms for concreting: Different types of form works for beams, slabs, columns, materials used for form work, requirement of good form work. Stripping time for removal of form works per IS 456. Joints in concrete construction: Types of joints, methods for joining old and new concrete, materials used for filling joints. Defects in concrete and its prevention methods.		
Method of Assessment	External Theory Exam – Pen Paper Test		
Learning Outcome 3	Identify and use admixtures in concrete mix as per given situation.	06	05
Contents	Admixtures in concrete: Purpose, properties and application for different types of admixture such as accelerating, retarding, water reducing, air entraining and super plasticizers.		
Method of Assessment	External Theory Exam – Pen Paper Test		

Course Outcome 5	Explain special concrete, extreme weather concreting and Non-destructive testing (NDT).	Teach Hrs.	Marks
Learning Outcome 1	Describe various special concrete in use.	06	10
Contents	Special Concrete: Properties, advantages and limitation of following types of Special concrete: Ready mix Concrete, Fiber Reinforced Concrete, High performance Concrete Self-compacting concrete and light weight concrete, under water concrete		
Method of Assessment	External Theory Exam – Pen Paper Test		
Learning Outcome 2	Select the type of weather concreting in the given situation.	06	10
Contents	Cold weather concreting: effect of cold weather on concrete, precautions to be taken while concreting in cold weather condition. Hot weather concreting: effect of hot weather on concrete, precautions to be taken while concreting in hot weather condition.		
Method of Assessment	Internal Theory Exam – Mid Semester Test II		
Learning Outcome 3	Describe the methods of NDT for the given field situation.	06	05
Content	Importance of NDT, limitations of NDT, methods of NDT. Non- destructive testing of concrete: Rebound hammer test, working principle of rebound hammer and factor affecting the rebound index, Ultrasonic pulse velocity test as per IS13311 (part 1 and 2). Interpretation of test results.		
Method of Assessment	External Theory Exam – Pen Paper Test		
Learning Outcome 4	Perform NDT of concrete by Rebound hammer.	02	
Content	Student should Perform Rebound hammer Test.		
Method of Assessment	Practical Exam : Both Internal and External		

Note: 1. Internal marks of practical exam is mentioned in Format 4.

2. External practical exam will be of maximum 30 marks and any of the practical mentioned in LO's can be assessed.

List of Suggested Books: -

S.No	Title	Author	Publisher
1.	Concrete Technology	Krishnamurthy, KT Rao, A Kasundra and AA Khandekar	Dhanpat Rai and Sons
2.	Text Book of Concrete Technology	BL Gupta and Amit Gupta	Standard Publishers Distributors
3.	Concrete Tecnology	Handoo, BL, Puri, LD and Mahajan Sanjay	Satya Prakashan
4.	Laboratory Manual on Concrete Technology	Hemant Sood , LN Mittal and PD Kulkarni	CBS Publishers
5.	Concrete Technology	M L Gambhir	Tata McGraw-Hill Education,
6.	Concrete Technology: Theory and Practice	M. S. Shetty	Neelkanth Publishers Pvt Ltd
7.	Concrete Technology (Hindi)	<u>D.V.Gupta</u> , <u>Vikram Singh</u>	Asian Publishers
8.	Concrete Technology (Hindi)	BL Gupta	Standard Publishers Distributors