RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	3				1	1	

COURSE NAME	**REINFORCED CEMENT CONCRETE STRUCTURES**
CO Description	**Explain the design philosophies of reinforced concrete structures including limit state and working stress.**
LO Description	**Describe the different types of steel and grade of concrete as per IS 456-2000**

SCHEME OF STUDY

S. No.	Learning Content	Method of teaching	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Purpose of concrete and steel in R.C.C, suitability of steel, types of steel like mild steel, HYSD steel and TMT bars, Grades of concrete and steel, Location of tension steel in beams and slabs, Types of loading on structures IS 875-1987, Various important codes and their purpose like IS 456 2000, IS 1893 etc.	Interactive classroom teaching, assignments, quiz, presentation.	Teacher will explain the contents and provide handouts to the students; teacher will conduct a quiz and give assignments to practice their knowledge.	4	0	Text book, video lectures, chalk board.	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Passing Criteria	Resources Required	External / Internal
1	Theory exam	Student will be asked to describe the different types of steel and grades of concrete.	06	Test Paper + Rating scale	Handouts, chalk board, PPT, text book, charts, video film.	External

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of end semester theory exam

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	3				1	2	

COURSE NAME	**REINFORCED CEMENT CONCRETE STRUCTURES**
CO Description	**Explain the design philosophies of reinforced concrete structures including limit state and working stress.**
LO Description	**Explain concepts of working stress method.**

SCHEME OF STUDY

S. No.	Learning Content	Method of teaching	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Basic concept, assumptions, equivalent area of section, stress-strain behavior for singly reinforced section, permissible stresses in concrete and steel, Neutral Axis of section, Concept of under reinforced, over reinforced and balanced section, Moment of resistance, Simple numerical problems on calculating moment of resistance and area of steel of singly and doubly reinforced rectangular sections only.	Interactive classroom teaching, assignments, quiz, presentation.	Teacher will explain the contents and provide handouts to the students; teacher will conduct a quiz and give assignments to practice their knowledge.	10	0	Text book, video lectures, chalk board.	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Passing Criteria	Resources Required	External / Internal
1	Theory exam	Student will be asked to explain concepts of working stress method, Neutral Axis, Moment of resistance and simple numerical problem of the same.	12	Test Paper + Rating scale	Handouts, chalk board, PPT, text book, charts, video film.	External

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of end semester theory exam

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	3				1	3	

COURSE NAME	**REINFORCED CEMENT CONCRETE STRUCTURES**
CO Description	**Explain the design philosophies of reinforced concrete structures including limit state and working stress.**
LO Description	**Explain concepts of limit state method.**

SCHEME OF STUDY

S. No.	Learning Content	Method of teaching	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Basic concept, types of limit states, characteristic and design values of strength and load, partial factor of safety for materials and loads, assumptions, comparison between WSM and LSM, Loading on structure as per IS 875, effective depth, effective span, nominal cover, minimum and maximum reinforcement, control of deflection	Interactive classroom teaching, assignments, quiz, presentation.	Teacher will explain the contents and provide handouts to the students; teacher will conduct a quiz and give assignments to practice their knowledge.	10	0	Text book, video lectures, chalk board.	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Passing Criteria	Resources Required	External / Internal
1	Theory exam	Student will be asked to explain concept of limit state method, partial factor of safety and effective span.	10	Test Paper + Rating scale	Handouts, chalk board, PPT, text book, charts, video film.	External

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of end semester theory exam

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	3				2	1	

COURSE NAME	**REINFORCED CEMENT CONCRETE STRUCTURES**
CO Description	**Analyse and design reinforced concrete beams for flexure, shear and bond applying principles of LSM.**
LO Description	**Analyse and design singly reinforced beam for flexure applying principles of LSM.**

SCHEME OF STUDY

S. No.	Learning Content	Method of teaching	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Stress-strain diagram for singly reinforced section, stress block diagram parameters (No derivation), Limiting depth of Neutral Axis, Actual depth of Neutral Axis for singly reinforced rectangular section, concept of under reinforced, over reinforced and balanced section, analysis of singly reinforced rectangular section, limiting and actual moment of resistance, simple numerical problems on determining moment of resistance and area of steel of singly reinforced rectangular sections only.	Interactive classroom teaching, assignments, quiz, presentation.	Teacher will explain the contents and provide handouts to the students; teacher will conduct a quiz and give assignments to practice their knowledge.	12	0	Text book, video lectures, chalk board.	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Passing Criteria	Resources Required	External / Internal
1	Theory exam	Student will be asked to 1. Draw stress strain diagram for singly reinforced section, stress block parameters. 2. Determine MR and area of steel of singly reinforced rectangular section.	12	Test Paper + Rating scale	Handouts, chalk board, PPT, text book, charts, video film.	External

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of end semester theory exam

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	3				2	2	

COURSE NAME	**REINFORCED CEMENT CONCRETE STRUCTURES**
CO Description	**Analyse and design reinforced concrete beams for flexure, shear and bond applying principles of LSM.**
LO Description	**Calculate the moment of resistance of doubly reinforced section applying principles of LSM.**

SCHEME OF STUDY

S. No.	Learning Content	Method of teaching	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Necessity of doubly reinforced section, stress-strain diagram of doubly reinforced section, analysis of doubly reinforced section, depth of neutral axis, moment of resistance of section, simple numerical problems on determining moment of resistance of doubly reinforced rectangular sections only.	Interactive classroom teaching, assignments, quiz, presentation.	Teacher will explain the contents and provide handouts to the students; teacher will conduct a quiz and give assignments to practice their knowledge.	8	0	Text book, video lectures, chalk board.	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Passing Criteria	Resources Required	External / Internal
1	Theory exam	Student will be asked to 1. Draw stress strain diagram for doubly reinforced section, stress block parameters. 2. Determine MR and area of steel of doubly reinforced rectangular section.	10	Test Paper + Rating scale	Handouts, chalk board, PPT, text book, charts, video film.	Internal

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of Internal Exam – Mid Semester Test-I

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	3				2	3	

COURSE NAME	**REINFORCED CEMENT CONCRETE STRUCTURES**
CO Description	**Analyse and design reinforced concrete beams for flexure, shear and bond applying principles of LSM.**
LO Description	**Analyse and design T beam section for neutral axis with in the flange applying principles of LSM.**

SCHEME OF STUDY

S. No.	Learning Content	Method of teaching	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Effective width of flange, stress-strain diagram of singly reinforced T beam, depth of neutral axis, moment of resistance of T section with neutral axis within the flange, Analysis of T-beam, Simple numerical and design problems of T section with neutral axis within the flange only.	Interactive classroom teaching, assignments, quiz, presentation.	Teacher will explain the contents and provide handouts to the students; teacher will conduct a quiz and give assignments to practice their knowledge.	8	0	Text book, video lectures, chalk board.	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Passing Criteria	Resources Required	External / Internal
1	Theory exam	Students will be asked to calculate neutral axis position, moment of resistance of T Beam for given data.	10	Test Paper + rating scale	Handouts, chalk board, PPT, text book, charts, video film.	Internal

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of Internal Exam – Mid Semester Test-II

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	3				2	4	

COURSE NAME	**REINFORCED CEMENT CONCRETE STRUCTURES**
CO Description	**Analyse and design reinforced concrete beams for flexure, shear and bond applying principles of LSM.**
LO Description	**Analyse and design beam for shear and bond criteria applying principles of LSM.**

SCHEME OF STUDY

S. No.	Learning Content	Method of teaching	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Necessity of shear reinforcement, nominal shear stress, shear strength of concrete, maximum shear stress, minimum shear reinforcement, forms of shear reinforcement, maximum spacing of stirrups, design of shear reinforcement, simple numerical problems on adequacy of section for shear, Concept of bond, bond stress, types of bond, check for bond stress, Development length in tension and compression, check for development length, lapping of bars, Anchorage value of hooks for 90° bend and 45° bend, Design of simply supported and cantilever rectangular beam for flexure including shear check.	Interactive classroom teaching, assignments, quiz, presentation.	Teacher will explain the contents and provide handouts to the students; teacher will conduct a quiz and give assignments to practice their knowledge.	12	0	Text book, video lectures, chalk board.	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Passing Criteria	Resources Required	External / Internal
1	Theory exam	Student will be asked to design shear reinforcement for given data, check development length.	10	Test Paper + rating scale	Handouts, chalk board, PPT, text book, charts, videos,	External

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of end semester theory exam

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	3				3	1	

COURSE NAME	**REINFORCED CEMENT CONCRETE STRUCTURES**
CO Description	**Apply the principles, analysis and design of reinforced concrete one way and two way slab and prepare drawings of beam and slab.**
LO Description	**Design one way and two way slab applying principles of LSM.**

SCHEME OF STUDY

S. No.	Learning Content	Method of teaching	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Classification of slabs as one way and two way, check for deflection and shear, main and distribution steel, codal provisions of slab, design of one way simply supported and cantilever slab with corners free to lift for flexure including check for deflection and shear, design of two way simply supported slab with corners free to lift for flexure including check for deflection and shear. Design procedure of waist slab of Dog legged staircase (No problem on dog legged staircase in external exam)	Interactive classroom teaching, assignments, quiz, presentation.	Teacher will explain the contents and provide handouts to the students; teacher will conduct a quiz and give assignments to practice their knowledge.	10	0	Text book, video lectures, chalk board.	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Passing Criteria	Resources Required	External / Internal
1	Theory exam	Student will be asked to design one way and two way slabs for given data.	10	Test Paper + rating scale	Handouts, chalk board, PPT, text book, charts, video film.	External

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of end semester theory exam

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	3				3	2	

COURSE NAME	**REINFORCED CEMENT CONCRETE STRUCTURES**
CO Description	**Apply the principles, analysis and design of reinforced concrete one way and two way slab and prepare drawings of beam and slab.**
LO Description	**Prepare a detailed plan and section of simply supported beam and slab.**

SCHEME OF STUDY

S. No.	Learning Content	Method of teaching	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	1.Draw cross-section and longitudinal section of simply supported rectangular beam showing reinforcement details. 2.Draw cross-section and longitudinal section of rectangular cantilever beam showing reinforcement details. 3.Draw cross-section and longitudinal section of simply supported T beam showing reinforcement details. 4.Draw plan and sections of simply supported one way slab with corners free to lift showing reinforcement details. 5.Draw plan and sections of simply supported two way slab with corners free to lift showing reinforcement details. 6.Draw plan and sections of dog legged staircase showing reinforcement details.	Interactive classroom teaching, assignments, quiz, presentation.	Teacher will explain the contents and provide handouts to the students; teacher will conduct a quiz and give assignments to practice their knowledge.	0	18	Text book, video lectures, chalk board.	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Passing Criteria	Resources Required	External / Internal
1	Practical Exam	Student will be asked to design and draw for the given problem.		Rating scale/ Rubrics	Handouts, chalk board, PPT, text book, charts, videos,	Both

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of Practical Exam : Internal Marks for Practical : 13 Marks

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	3				4	1	

COURSE NAME	**REINFORCED CEMENT CONCRETE STRUCTURES**
CO Description	**Analyse and design the axially loaded short column applying principles of LSM.**
LO Description	**Design axially loaded short column and explain procedure of designing isolated footing**

SCHEME OF STUDY

S. No.	Learning Content	Method of teaching	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Classification of columns, effective length, minimum eccentricity, IS specifications of longitudinal and lateral reinforcement, Simple numerical and design problems of short axially loaded square, circular and rectangular columns Design steps of square isolated footing of uniform thickness (No numerical problems)	Interactive classroom teaching, assignments, quiz, presentation.	Teacher will explain the contents and provide handouts to the students; teacher will conduct a quiz and give assignments to practice their knowledge.	09	0	Text book, video lectures, chalk board.	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Passing Criteria	Resources Required	External / Internal
1	Theory exam	Student will be asked to classify columns, recall IS specifications, design a short column for given data.	10	Test Paper + rating scale	Handouts, chalk board, PPT, text book, charts, video film.	External

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of end semester theory exam

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	3				4	2	

COURSE NAME	**REINFORCED CEMENT CONCRETE STRUCTURES**
CO Description	**Analyse and design the axially loaded short column applying principles of LSM.**
LO Description	**Prepare a detailed plan and section of column and footing.**

SCHEME OF STUDY

S. No.	Learning Content	Method of teaching	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	1. Draw plan and section of column showing reinforcement details. 2. Column and joint detailing as per IS 13920 3. Draw plan and sections of square or rectangular footing showing reinforcement details.	Interactive classroom teaching, assignments, quiz, presentation.	Teacher will explain the contents and provide handouts to the students; teacher will conduct a quiz and give assignments to practice their knowledge.	0	09	Text book, video lectures, chalk board.	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Passing Criteria	Resources Required	External / Internal
1	Practical exam	Student will be asked to design and draw for the given data.	0	Rating scale/ Rubrics	Handouts, chalk board, PPT, text book, charts, video film.	Both

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of Practical Exam : Internal Marks for Practical : 07 Marks

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	3				5	1	

COURSE NAME	**REINFORCED CEMENT CONCRETE STRUCTURES**
CO Description	**Explain the concept of pre-stressed concrete, its losses and fundamentals of earthquake engineering.**
LO Description	**Describe pre–stressed concrete and its methods.**

SCHEME OF STUDY

S. No.	Learning Content	Method of teaching	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Concept of pre-stressed concrete, advantage and disadvantage of pre-stressing, materials used in pre-stressed concrete, methods of pre-stressing: pre tensioning and post tensioning, losses in pre stressing. No numerical problems	Interactive classroom teaching, assignments, quiz, presentation.	Teacher will explain the contents and provide handouts to the students; teacher will conduct a quiz and give assignments to practice their knowledge.	05	0	Text book, video lectures, chalk board.	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Passing Criteria	Resources Required	External / Internal
1	Theory exam	Student will be asked to submit assignments giving details regarding pre stressing.	05	Rating scale/ Rubrics	Handouts, chalk board, PPT, text book, charts, video film.	Internal

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of Internal Exam – Assignments/ Seminars/Presentations

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	3				5	2	

COURSE NAME	**REINFORCED CEMENT CONCRETE STRUCTURES**
CO Description	**Explain the concept of pre-stressed concrete, its losses and fundamentals of earthquake engineering.**
LO Description	**Describe the importance of earthquake engineering in RCC structures.**

SCHEME OF STUDY

S. No.	Learning Content	Method of teaching	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Introduction, Richter Scale, earthquake zones in India as per IS 1893, causes of failures of structure during earthquake, ductile detailing, principal of constructing earthquake resistant buildings	Interactive classroom teaching, assignments, quiz, presentation.	Teacher will explain the contents and provide handouts to the students; teacher will conduct a quiz and give assignments to practice their knowledge.	05	0	Text book, video lectures, chalk board.	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Passing Criteria	Resources Required	External / Internal
1	Theory exam	Student will be asked to submit assignments giving details regarding earthquake.	05	Rating scale/ Rubrics	Handouts, chalk board, PPT, text book, charts, video film.	Internal

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of Internal Exam – Assignments/Seminars/Presentations

Note: 1. Use of IS 456-2000 is permitted in the examination.

2. Internal practical marks of practical LOs are mentioned in additional instructions.

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