

| DESIGN OF CONCRETE BRIDGES | | | | | | | | | | | | | | | |
|--|--|-----------------|------------|--------------|---------------|-------------|-----|-----|-----|------|------|------|------|------|------|
| As per NEP, Outcome Based Education(OBE) and Choice Based Credit System (CBCS) | | | | | | | | | | | | | | | |
| SEMESTER – III | | | | | | | | | | | | | | | |
| Course Code | 23SEC311 | CIE | 50 | | | | | | | | | | | | |
| Number ofLecture Hours/Week | 03 | SEE | 50 | | | | | | | | | | | | |
| Total Number ofLecture Hours | 40 | Exam Hours | 03 | | | | | | | | | | | | |
| CREDITS – 03 | | | | | | | | | | | | | | | |
| Course objectives: | | | | | | | | | | | | | | | |
| The objective of thiscourse is to make students to learn principles of StructuralDesign, | | | | | | | | | | | | | | | |
| 1 . To designdifferenttypesofstructuresand to detailthe structures. | | | | | | | | | | | | | | | |
| 2. To evaluate performance of thestructures. | | | | | | | | | | | | | | | |
| Course Outcomes(COs): | | | | | | | | | | | | | | | |
| On completion of this course, the student will be able to | | | | | | | | | | | | | | | |
| CO# | Course Outcomes | POs | PSOs | | | | | | | | | | | | |
| CO1 | AchieveKnowledgeofdesignanddevelopmentofproblem-solvingskills. | | | | | | | | | | | | | | |
| CO2 | Understand the principles ofoptimization. | | | | | | | | | | | | | | |
| CO3 | Design and development ofanalyticalskills. | | | | | | | | | | | | | | |
| CO4 | Summarize the Linear, Non-linear and GeometricProgramming | | | | | | | | | | | | | | |
| CO5 | Understands the concept of Dynamicprogramming | | | | | | | | | | | | | | |
| Bloom’s level of the course outcomes: | | | | | | | | | | | | | | | |
| CO# | Bloom’s Level | | | | | | | | | | | | | | |
| | Remember (L1) | Understand (L2) | Apply (L3) | Analyze (L4) | Evaluate (L5) | Create (L6) | | | | | | | | | |
| CO1 | √ | √ | √ | √ | | | | | | | | | | | |
| CO2 | √ | √ | √ | √ | √ | | | | | | | | | | |
| CO3 | √ | √ | √ | √ | | | | | | | | | | | |
| CO4 | | | | √ | √ | | | | | | | | | | |
| CO5 | √ | √ | | √ | | | | | | | | | | | |
| Course Articulation Matrix / Course mapping : | | | | | | | | | | | | | | | |
| CO# | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| CO1 | 3 | 3 | 2 | 1 | | | | | 1 | | | 1 | 3 | | |
| CO2 | 3 | 3 | 3 | 1 | 1 | | | | 1 | | | 1 | 3 | | |
| CO3 | 3 | 3 | 3 | 2 | 1 | | | | 1 | | | 1 | 3 | | |
| CO4 | 3 | 2 | 3 | 2 | | | | | 1 | | | 1 | 3 | | |
| CO5 | 3 | 2 | 3 | 1 | | | | | 1 | | | 2 | 3 | | |
| Note: 1-Low, 2-Medium, 3-High | | | | | | | | | | | | | | | |

| Modules | Teaching Hours | RBT Level |
|---|----------------|---|
| Module -1 | | |
| Introduction: Historical Developments, Site Selection for Bridges, Classification of Bridges Forces on Bridges. Bridge substructures: Abutments, piers and wing walls Balanced Cantilever Bridge: Introduction and proportioning of components, Design of simply supported portion and design of cantilever portion, design of articulation | 12 Hours | L ₁ , L ₂ , L ₃ , L ₄ |
| Module -2 | | |
| Box Culvert: Different Loading Cases IRC Class AA Tracked, Wheeled and Class A Loading, working out the worst combination of loading, Moment Distribution, Calculation of BM & SF, Structural Design of Slab Culvert, with Reinforcement Details. | 10 Hours | L ₂ , L ₃ , L ₄ |
| Module -3 | | |
| T Beam Bridge Slab Design: Proportioning of Components Analysis of interior Slab & Cantilever Slab Using IRC Class AA Tracked, Wheeled Class A Loading, Structural Design of Slab, with Reinforcement Detail. T Beam Bridge Cross Girder Design: Analysis of Cross Girder for Dead Load & Live Load Using IRC Class AA Tracked, Wheeled Class A Loading A Loads, Structural Design of Beam, with Reinforcement Detail. | 10 Hours | L ₂ , L ₃ , L ₄ |
| Module -4 | | |
| T Beam Bridge Main Girder Design: Analysis of Main Girder for Dead Load & Live Load Using IRC Class AA Tracked, Wheeled Class A Loading Using COURBON'S Method, Analysis of Main Girder Using HENDRY-JAEGER and MORICE-LITTLE Method for IRC Class AA Tracked vehicle only, BM & SF for different loads, Structural Design of Main Girder with Reinforcement Details | 10 Hours | L ₂ , L ₃ , L ₄ |
| Module -5 | | |
| PSC Bridges: Introduction to Pre and Post Tensioning, Proportioning of Components, Analysis and Structural Design of Slab, Analysis of Main Girder using COURBON's Method for IRC Class AA tracked vehicle, Calculation of pre-stressing force, cable profile and calculation of stresses, Design of End block and detailing of main girder | 10 Hours | L ₁ , L ₂ , L ₃ , L ₄ |
| Question paper pattern: <ul style="list-style-type: none"> The question paper will have ten questions. Each full question consists of 10 marks. There will be 2 full questions (with a maximum of four sub questions) from each module. Each full question will have sub questions covering all the topics under a module. The students will have to answer 5 full questions, selecting one full question from each module. | | |
| REFERENCE BOOKS: <ol style="list-style-type: none"> “Essentials of Bridge Engineering”- D Johnson Victor, Oxford & IBH Publishing Co New Delhi “Design of Bridges”- N Krishna Raju, Oxford & IBH Publishing Co New Delhi “Principles and Practice of Bridge Engineering”- S P Bindra Dhanpat Rai & Sons New Delhi IRC 8 – 1988 “Standard Specifications and Code of Practice for Road Bridges”- Section II Loads and Stresses, The Indian Road Congress New Delhi IRC 21 – 1988 “Standard Specifications and Code of Practice for Road Bridges”- Section III Cement Concrete (Plain and reinforced) The Indian Road Congress New Delhi IS 458 – 2000 “Indian Standard Plain and Reinforced Concrete Code of Practice”- (Fourth Revision) BIS New Delhi | | |

| INDUSTRIAL MANAGEMENT | | | | | | | | | | | | | | | |
|--|--|-----------------|------------|--------------|---------------|-------------|-----|-----|-----|------|------|------|------|------|------|
| As per NEP, Outcome Based Education(OBE) and Choice Based Credit System (CBCS) | | | | | | | | | | | | | | | |
| SEMESTER – III | | | | | | | | | | | | | | | |
| Course Code | 23IM34 | CIE | 50 | | | | | | | | | | | | |
| Number of Lecture Hours/Week | 03 | SEE | 50 | | | | | | | | | | | | |
| Total Number of Lecture Hours | 40 | Exam Hours | 03 | | | | | | | | | | | | |
| CREDITS – 03 | | | | | | | | | | | | | | | |
| Course Outcomes(COs): | | | | | | | | | | | | | | | |
| On completion of this course, the student will be able to | | | | | | | | | | | | | | | |
| CO# | Course Outcomes | POs | PSOs | | | | | | | | | | | | |
| CO1 | Explain the fundamental principles of industrial management, organizational structures, and the impact of economic, social, political, and legal environments on businesses. | | | | | | | | | | | | | | |
| CO2 | Apply management principles to effectively plan, organize, and staff organizations while designing recruitment and HRD processes. | | | | | | | | | | | | | | |
| CO3 | Develop leadership, communication, and decision-making skills to direct, manage, and control organizational activities. | | | | | | | | | | | | | | |
| CO4 | Analyze organizational behavior, motivation theories, and conflict management strategies to manage change and foster a productive workplace. | | | | | | | | | | | | | | |
| CO5 | Evaluate productivity improvement methods and apply modern management techniques, including BPR, Benchmarking, ERP, MIS, and Industry 4.0. | | | | | | | | | | | | | | |
| Bloom’s level of the course outcomes: | | | | | | | | | | | | | | | |
| CO# | Bloom’s Level | | | | | | | | | | | | | | |
| | Remember (L1) | Understand (L2) | Apply (L3) | Analyze (L4) | Evaluate (L5) | Create (L6) | | | | | | | | | |
| CO1 | √ | √ | √ | | | | | | | | | | | | |
| CO2 | √ | √ | √ | | | | | | | | | | | | |
| CO3 | √ | √ | √ | | | | | | | | | | | | |
| CO4 | √ | √ | √ | | | | | | | | | | | | |
| CO5 | √ | √ | √ | | | | | | | | | | | | |
| Course Articulation Matrix / Course mapping : | | | | | | | | | | | | | | | |
| CO# | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| CO1 | 3 | 2 | | - | - | 2 | 1 | - | - | - | - | - | - | - | 3 |
| CO2 | 3 | 2 | 2 | - | - | 1 | - | 1 | 1 | 1 | - | - | - | - | 3 |
| CO3 | 3 | 3 | | - | 1 | | 2 | 1 | 1 | 1 | - | - | - | - | 3 |
| CO4 | 3 | 3 | 2 | - | - | 1 | 2 | - | 1 | 1 | - | 2 | - | - | 3 |
| CO5 | 3 | 3 | 2 | 1 | 1 | 1 | 2 | - | 1 | 1 | 1 | 2 | - | - | 3 |
| Note: 1-Low, 2-Medium, 3-High | | | | | | | | | | | | | | | |

| Modules | Teaching Hours | RBT Level |
|---|----------------|-----------|
| Module -1 | | |
| Introduction to Industrial Management Industrial Management: Meaning, Definition, Objective, Need, Scope, Evolution and developments., Evolution of Management Principles, Definition of Management and Functions – Approaches to the study of Management – Mintzberg's Ten Managerial Roles – Principles of Taylor; Fayol; Weber; Parker – Forms of Organization: Sole Proprietorship; Partnership; Company (Private and Public); Cooperative – Public Sector Vs Private Sector Organization – Business Environment: Economic; Social; Political; Legal – Trade Union: Definition; Functions; Merits & Demerits. | 08 | L1,L2, L3 |
| Module -2 | | |
| Functions of Management – Planning, Organizing, Staffing Planning: Characteristics; Nature; Importance; Steps; Limitation; Planning Premises; Strategic Planning; Vision & Mission statement in Planning– Organizing: Organizing Theory; Principles; Types; Departmentalization; Centralization and Decentralization; Authority & Responsibility – Staffing: Systems Approach; Recruiting and Selection Process; Human Resource Development (HRD) Concept and Design. | 08 | L1,L2, L3 |
| Module -3 | | |
| Functions of Management – Directing, Communication, and Controlling Directing (Leading): Leadership Traits; Style; Morale; Managerial Grids (Blake-Mouton, Reddin) – Communication: Purpose; Model; Barriers – Controlling: Process; Types; Levels; Guidelines; Audit (External, Internal, Merits); Preventive Control – Decision Making: Elements; Characteristics; Nature; Process; Classifications. | 08 | L1,L2,L 3 |
| Module -4 | | |
| Organization Theory Organizational Conflict: Positive Aspects; Individual; Role; Interpersonal; Intra Group; Inter Group; Conflict Management – Maslow's hierarchy of needs theory; Herzberg's motivation-hygiene theory; McClelland's three needs motivation theory; Vroom's valence-expectancy theory – Change Management: Concept of Change; Lewin's Process of Change Model; Sources of Resistance; Overcoming Resistance; Guidelines to managing Conflict. | 08 | L1,L2, L3 |
| Module -5 | | |
| Productivity and Modern Topics in Industrial Management Productivity: Concept; Measurements; Affecting Factors; Methods to Improve – Modern Topics (concept, feature/characteristics, procedure, merits, and demerits): Business Process Reengineering (BPR); Benchmarking; SWOT/SWOC Analysis; Total Productive Maintenance; Enterprise Resource Planning (ERP); Management of Information Systems (MIS), Industry 4.0. | 08 | L1,L2,L3 |
| Question paper pattern: <ul style="list-style-type: none"> The question paper will have ten questions. Each full question consists of 10 marks. There will be 2 full questions (with a maximum of four sub questions) from each module. Each full question will have sub questions covering all the topics under a module. The students will have to answer 5 full questions, selecting one full question from each module. | | |

REFERENCE BOOKS:

1. Joseph J, Massie, “Essentials of Management”, 4th Edition, Pearson Education, 1987.
2. Saxena, P. K., “Principles of Management: A Modern Approach”, Global India Publications, 2009.
3. S. Chandran, “Organizational Behaviours”, Vikas Publishing House Pvt. Ltd., 1994.
4. Richard L. Daft, “Organization Theory and Design”, South-Western College Publishing, 11th Edition, 2012.
5. S. Trevis Certo, “Modern Management Concepts and Skills”, Pearson Education, 2018.

Text Books:

1. "Industrial Engineering and Management" by S.C. Sharma and T.R. Banga
2. "A Textbook of Industrial Management" by A.P. Verma and N. Mohan.
3. "Industrial Management" by Dr. O.N. Pandey and Bhupesh Aneja.
4. Koontz. H. and Weihrich. H., “Essentials of Management: An International Perspective”, 8th Edition, Tata McGraw-Hill, New Delhi, 2010.
5. M. Govindarajan and S. Natarajan, “Principles of Management”, Prentice Hall of India, New Delhi, 2009.