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| **Name of the Faculty** | **:** |   |  |  |  |
| **Discipline** | **:** | **Civil Engineering** |  |  |  |
| **Semester** | **:** | **6th** |  |  |  |
| **Subject** | **:** | **Earthquake Resistant Building Construction** |  |  |  |

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| **Lesson Plan Duration :** | **15 Weeks (from Jan 9 -2019 to Apr-2019)** |
|  |  |  |  |
| **Week** |  |  | **Theory** |
|  | **Lecture Day** |  | **Topic (including assignment / test)** |
| 1st | 1 |  | **Introduction to the Subject and its necessity** |
|  | 2 |  | **1. Elements of Engineering Seismology :** |
|  |  |  | General features of tectonic of seismic regions. |
|  | 3 |  | Causes of earthquakes, Seismic waves, |
| 2nd | 1 |  | Earthquake size (magnitude and intensity), |
|  | 2 |  | Epicentre, Seismograph, |
|  | 3 |  | Classification of earthquakes, |
| 3rd | 1 |  | Seismic zoning map of India, |
|  | 2 |  | Static and Dynamic Loading, Fundamental period. |
|  | 3 |  | **2. Seismic Behaviour of Traditionally-Built Constructions of India :** |
|  |  |  | Performance of building during earthquakes |
| 4th | 1 |  | Mode of failure: Out-of-plane failure, in-plane failure, |
|  | 2 |  | Mode of failure: Diaphragm failure, Connection failure, |
|  | 3 |  | Mode of failure: Non-structural components failure |
| 5th | 1 |  | **Revision/Assignment-I** |
|  | 2 |  | **Sessional Test -I** |
|  |  3 |  | **3. Special construction method :** |
|  |  |  | Special construction methods |
| 6th | 1 |  | Special construction methods |
|  | 2 |  | Tips and Precautions to be observed while planning, |
|  | 3 |  | Designing and Construction of earthquake resistant building. |
| 7th | 1 |  | Designing and Construction of earthquake resistant building. |
|  | 2 |  | Designing and Construction of earthquake resistant building. |
|  | 3 |  | **4. Introduction to various Seismic IS codes :** |
|  |  |  | IS: 4326, IS: 13828, |
| 8th | 1 |  | IS: 1893(Part 1), |
|  | 2 |  | IS: 154326 and |
|  | 3 |  | IS: 13920 (latest edition) |
| 9th | 1 |  | **Revision/Assignment-II** |
|  | 2 |  | **5. Seismic Provision of Strengthening and Retrofitting :** |
|  |  |  | Seismic Provision of Strengthening and Retrofitting |
|  | 3 |  | Seismic Provision of Strengthening and Retrofitting |
| 10th | 1 |  | Measures for Traditionally-Built Constructions, |
|  | 2 |  | Brick and RCC Structures |
|  | 3 |  | Brick and RCC Structures |
| 11th | 1 |  | Revision/Quarries |
|  | 2 |  | **Sessional Test -II** |
|  | 3 |  | **6. Provision of reinforcement detailing in masonry and RC** |
|  |  |  | **constructions :** |
| 12th | 1 | Provision of reinforcement detailing in masonry constructions |
|  | 2 | Provision of reinforcement detailing in RC constructions |
|  | 3 | Provision of reinforcement detailing in RC constructions |
| 13th | 1 | Provision of reinforcement detailing in RC constructions |
|  |  |  |
|  | 2 | **7. Disaster Management :** |
|  |  | Disaster rescue, Psychology of rescue, |
|  | 3 | Rescue workers, Rescue plan, |
| 14th | 1 | Rescue by steps, |
|  | 2 | Rescue equipment, |
|  | 3 | Safety in rescue operations, |
| 15th | 1 | Debris clearance  |
|  | 2 | Casuality management |
|  | 3 | **Sessional Test -III** |

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| **Name of the Faculty** | **:** |  M.P.SINGH |  |  |  |
| **Discipline** | **:** | **Civil Engineering** |  |  |  |
| **Semester** | **:** | **6th** |  |  |  |
| **Subject** | **:** | **RAILWAYS, BRIDGES AND TUNNELS** |  |  |  |

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| **Lesson Plan Duration :** | **15 Weeks (from Jan 9-2019 to Apr-2019)** |
|  |  |  |  |
| **Week** |  |  | **Theory** |
|  | **Lecture Day** |  | **Topic (including assignment / test)** |
| 1st | 1 |  | **Introduction to the Subject and its necessity** |
|  |  |  |  1. Introduction to Indian Railways |
|  | 3 |  | 2. Railway surveys: Factors influencing the railways route |
|  |  4 |  brief description of various types of railway survey 3. Classification of permanent way describing its component parts |
|  |
| 2nd | 1 |  | 4. Rail Gauge: Definition, types, practice in India |
|  | 2 |  | 5. Rails – types of rails |
|  | 3 |  | Revision/Quarries |
|  |  4 | 6. Rail Fastenings: Rail joints, types of rail joints, fastenings for rails, |
|  |
| 3rd | 1 |  | fish plates, |
|  |  |  | bearing plates |
|  | 2 |  | 7. Sleepers: Functions of sleepers, types of sleepers, |
|  | 3 |  | Requirements of an ideal material for sleepers. |
|  |  4 | 8. Ballast: Function of ballast, Requirements of an ideal material for ballast |
|  |
| 4th | 1 |  | **Revision** |
|  | 2 |  | 9. Crossings and signallings: Brief description regarding different types |
|  |  |  | of crossings/signallings |
|  | 3 |  | Crossings and signallings: |
|  |  |  | Brief description regarding different types of crossings |
|  |  |  | (Latest electronics operated signal devices ) |
|  |  4 | Crossings and signallings:Brief description regarding different types of signallings (Latestelectronics operated signal devices ) 10. Maintenance of track: Necessity, maintenance of track |
|  |
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| 5th | 1 |  | inspection of soil, |
|  | 2 |  | Track  |
|  | 3 |  | Fixtures, maintenance and boxing of ballast maintenance gauges, tools |
|  |  4 | **Test –I** |
|  |
| 6th | 1 |  | 11. Earth work and drainage: Features of rail road, bed level, |
|  | 2 |  | width of formation, side slopes, |
|  | 3 |  | Drains: methods of construction, |
|  | 4 |  | requirement of drainage system, 12. Introduction, Bridge – its function and component parts, difference between a bridge and a culvert |

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| 7th | 1 | 13. Classification of Bridges |
|  |  | Their structural elements and suitability: |
|  |  | 13.1 | According to life-permanent and temporary |
|  | 2 | 13.2 | According to deck level – Deck, through and semi-through |
|  | 3 | 13.3 | According to material –timber, masonry, |
|  | 4 | steel, RCC, pre-stressed |
|  |
| 8th | 1 | 13.4 | According to structural form; |
|  |  | - Grade separators-Railway Over-bridges (ROB), Railway under-bridge |
|  |  | (RUB) |
|  | 2 | - Beam type –RCC, T-Beam, |
|  | 3 | steel girder bridges, |
|  | 4 | plate girder and box girder, balanced cantilever, |
|  |
| 9th | 1 | Trussed bridges. |
|  | 2 | - Arch type – open spandrel and filled spandrel barrel and rib type |
|  | 3 | - Suspension type – unstiffened and stiffened and table (its |
|  |  | description with sketches) |
|  | 4 | - According to the position of highest flood level submersible and non-Submersible |
|  |
|  |
| 10th | 1 | 13.5 | IRC classification |
|  | 2 | 14. Bridge Foundations: Introduction to open foundation, |
|  | 3 | pile foundation, |
|  | 4 | Well foundation, 15. Piers, Abutments and Wing-walls: Piers-definition, parts; types –solid (masonry and RCC), open |
|  |
|  |
| 11th | 1 | Revision |
|  | 2 | **Test -II** |
|  | 3 | 15.2 | Abutments and wing walls – definition, types of abutments (straight |
|  |  | and tee), |
|  | 4 | abutment with wing walls (straight and splayed), abutment with wing walls (return and curved) |
|  |
| 12th | 1 | 15.3 | Launching of Equipment Bridges |
|  | 2 | 15.3 | Launching of Equipment Bridges |
|  | 3 | 16. Bridge bearings |
|  |  | Purpose of bearings; |
|  | 4 | types of bearings – fixed plate, types of bearings –rocker and roller |
|  |
| 13th | 1 | **Revision** |
|  | 2 | 17. Maintenance of Bridges |
|  |  | 17.1 | Inspection of Steel and Equipment bridges |
|  | 3 | 17.2 | Routine maintenance |
|  | 4 | 18. Definition and necessity of tunnels 19. Typical section of tunnels for a national highway, |
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|  |
| 14th | 1 | Typical section of tunnels for single and double broad gauge railway |
|  |  | track |  |
|  | 2 | Practice of the typical cross-section of tunnels for highways and railway track |

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|  | 3 | 20. Ventilation –necessity |
|  | 4 | Methods of ventilation: Blowing and Exhaust combination of blowing and exhaust, |
|  |
| 15th | 1 | 21. Drainage method of draining water in tunnels |
|  | 2 | Drainage method of draining water in tunnels |
|  | 3 | 22. Lighting of tunnels |
|  | 4 | **Assignment-III, Test III** |
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| **Name of the Faculty** | **:** |   |  |  |  |
| **Discipline** | **:** | **Civil Engineering** |  |  |  |
| **Semester** | **:** | **6th** |  |  |  |
| **Subject** | **:** | **QUANTITY SURVEYING AND VALUATION** |  |  |  |

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| **Lesson Plan Duration :** | **15 Weeks (from Jan-2019 to Apr-2019)** |
|  |  |  |  |  |
| **Week** |  |  |  | **Theory** |
|  | **Lecture Day** |  |  | **Topic (including assignment / test)** |
| 1st | 1st |  | **Introduction to the Subject and its necessity** |
|  | 2nd |  | **1. Introduction to quantity surveying and its importance.** |
|  | 3rd |  | Duties of quantity surveyor |
|  | 4th |  | **2. Types of estimates** |
|  |  |  | 2.1 | Preliminary estimates - Plinth area estimate |
|  | 5th |  | - Cubic rate estimate, - Estimate per unit base |
| 2nd | 6th |  | 2.2 | Detailed estimates – Definition, - Stages of preparation, – details of |
|  |  |  | measurement and calculation of quantities and abstract |
|  | 7th |  | - Stages of preparation – details of measurement and calculation of |
|  |  |  | quantities and abstract |
|  | 8th |  | **3. Measurement** |
|  |  |  | 3.1 | Units of measurement for various items of work as per BIS:1200 |
|  |  |  | 3.2 | Rules for measurements |
|  | 9th |  | **Revision** |
|  | 10th |  | 3.3 | Different methods of taking out quantities – centre line method |
| 3rd | 11th |  | 3.3 | Different methods of taking out quantities – long wall and short wall |
|  |  |  | method |
|  | 12th |  | Practice of taking out quantities |
|  | 13th |  | **4. Preparation of Detailed and Abstract Estimates from Drawings** |
|  |  |  | **for:** |
|  |  |  | 4.1 | A small residential building with a flat roof and pitched roof building |
|  |  |  | comprising of |
|  |  |  | - Two rooms with W.C., bath, kitchen and verandah |
|  | 14th |  | - Two rooms with W.C., bath, kitchen and verandah |
|  | 15th |  | - Two rooms with W.C., bath, kitchen and verandah |
| 4th | 16th |  | **Revision** |
|  | 17th |  | - Two rooms with W.C., bath, kitchen and verandah |
|  | 18th |  | - Two rooms with W.C., bath, kitchen and verandah |
|  | 19th |  | 4.2 | Earthwork for unlined channel |
|  | 20th |  | 4.2 | Earthwork for unlined channel |
| 5th | 21st |  | 4.3 | WBM road and pre-mix carpeting |
|  | 22nd |  | 4.3 | WBM road and pre-mix carpeting |
|  | 23rd |  | **Revision/Assignment-I** |
|  | 24th |  |  **Test -I** |
|  | 25th |  | 4.4 | Single span RCC slab culvert |
| 6th | 26th |  | 4.4 | Single span RCC slab culvert |
|  | 27th |  | 4.5 | Earthwork for plain and hill roads |
|  | 28th |  | 4.5 | Earthwork for plain and hill roads |
|  | 29th |  | 4.5 | Earthwork for plain and hill roads |

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|  | 30th | 4.6 | RCC work in beams, slab, column and lintel, foundations |
| 7th | 31st | 4.6 | RCC work in beams, slab, column and lintel, foundations |
|  | 32nd | 4.6 | RCC work in beams, slab, column and lintel, foundations |
|  | 33rd | 4.7 users septic tank - 10 users |
|  |  | - 50 users |
|  | 34th | 4.7 users septic tank - 10 users |
|  |  | - 50 users |
|  | 35th | **Revision** |
| 8th | 36th | 4.7 users septic tank - 10 users |
|  |  |  |
|  | 37th | 4.7 users septic tank  |
|  |  | - 50 users |
|  | 38th | 4.7 users septic tank  |
|  |  | - 50 users |
|  | 39th | **5. Calculation of quantities of materials for** |
|  |  | 5.1 | Cement mortars of different proportion |
|  | 40th | 5.2 | Cement concrete of different proportion |
| 9th | 41st | 5.3 | Brick/stone masonry in cement mortar |
|  | 42nd | 5.4 | Plastering and pointing |
|  | 43rd | 5.5 | White washing, painting |
|  | 44th | 5.6 | R.C.C. work in slab, beams |
|  | 45th | **Revision** |
| 10th | 46th | **6. Analysis of Rates** |
|  |  | 6.1 | Steps involved in the analysis of rates. Requirement of material, |
|  |  | labour, sundries, contractor’s profit and overheads |
|  | 47th | 6.2 | Analysis of rates for finished items when data regarding labour, rates |
|  |  | of material and labour is given: - Earthwork in excavation in |
|  |  | hard/ordinary soil and filling with a concept of lead and lift |
|  | 48th | - RCC in roof slab/beam/lintels/columns |
|  | 49th | - Brick masonry in cement mortar |
|  | 50th | - Cement Plaster |
|  |  | - White washing, painting |
| 11th | 51st | - Stone masonry in cement mortar |
|  | 52nd | 6.3 | Running and maintenance cost of construction equipment |
|  | 53rd | **Revision/Assignment-II** |
|  | 54th | **Test -II** |
|  | 55th | **7 Contractor-ship** |
|  |  | - Meaning of contract |
|  |  | - Qualities of a good contractor and their qualifications |
| 12th | 56th | - Essentials of a contract |
|  | 57th | - Types of contracts, their advantages, dis-advantages and suitability, |
|  |  | system of payment |
|  | 58th | - Single and two cover-bids; tender, tender forms and documents, tender |
|  |  | notice, |
|  |  | submission of tender and deposit of earnest money, security deposit, |
|  |  | retention money, maintenance period |
|  | 59th | - Classification and types of contracting firms/construction companies |
|  | 60th | **8 Preparation of Tender Document based on Common Schedule** |
|  |  | **Rates (CSR)** |
|  |  | - Introduction to CSR and calculation of cost based on premium on CSR |

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| 13th | 61st | - Exercises on writing detailed specifications of different types of |
|  |  | building works from excavation to foundations, superstructure and |
|  |  | finishing operation |
|  | 62nd | **Revision** |
|  | 63rd | - Exercises on preparing tender documents for the following |
|  |  | a) Earth work |
|  | 64th | b) Construction of a small house as per given drawing |
|  | 65th | c) RCC works |
|  |  | d) Pointing, plastering and flooring |
| 14th | 66th | e) White-washing, distempering and painting |
|  |  | f) Wood work including polishing |
|  |  | g) Sanitary and water supply installations |
|  | 67th | h) False ceiling, aluminum (glazed) partitioning |
|  |  | i) Tile flooring including base course |
|  | 68th | j) Construction of W.B.M/Concrete road |
|  | 69th | **9. Exercises on preparation of comparative statements for item rate** |
|  |  | **contract** |
|  | 70th | **10. Valuation** |
|  |  | a) Purpose of valuation, principles of valuation |
| 15th | 71st | b) Definition of various terms related to valuation like depreciation, |
|  |  | sinking |
|  |  | fund, salvage and scrap value, market value, fair rent, year’s purchase |
|  |  | etc. |
|  | 72nd | c) Methods of valuation |
|  |  | (i) replacement cost method |
|  | 73rd | c) Methods of valuation |
|  |  | (ii) rental return method |
|  | 74th | **Assignment-III** |
|  | 75th | **Test -III** |

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| **Name of the Faculty :** |  | M.P  | SINGH |  |  |  |
| **Discipline** | **:** | **Civil Engineering** |  |  |  |
| **Semester** | **:** | **6th** |  |  |  |  |
| **Subject** | **:** | **CONSTRUCTION MANAGEMENT AND ACCOUNTS** |  |
| **Lesson Plan Duration :** | **15 Weeks (from Jan-2019 to Apr-2019)** |  |  |  |
|  |  |  |  |  |  |  |  |
| **Week** |  |  |  | **Theory** |  |  |  |
|  | **Lecture Day** |  |  | **Topic (including assignment / test)** |  |  |
| 1st | 1 |  | **Introduction to the Subject and its necessity** |  |  |  |
|  | 2 |  |  |  |  |  |
|  |  |  | **1. Introduction:** |  |  |  |
|  |  |  | 1.1 | Significance of construction management |  |  |  |
|  |  |  | 1.2 | Main objectives of construction management and overview of the |
|  |  |  | subject |  |  |  |
|  | 3 |  | 1.3 | Functions of construction management, planning, organising, |  |
|  |  |  | staffing, directing, controlling and coordinating, meaning of each of |
|  |  |  | these with respect to construction job. |  |  |  |
|  | 4 |  | 1.4 | Classification of construction into light, heavy and industrial |  |
|  |  | construction |  |  |  |
|  |  | 1.5 Stages in construction from conception to completion1.6 The construction team: owner, engineer, architect and contractors, |
|  |  |
|  |  | their functions and inter-relationship |  |  |  |
| 2nd | 5 |  | **2. Construction Planning:** |  |  |  |
|  |  |  | 2.1 Importance of construction planning |  |  |  |
|  | 6 |  | 2.2 | Stages of construction planning |  |  |  |
|  |  |  | - Pre-tender stage |  |  |  |
|  |  |  | - Contract stage |  |  |  |
|  | 7 |  | 2.3 | Scheduling construction works by bar charts |  |  |  |
|  |  |  | - Definition of activity, identification of activities |  |  |  |
|  |  |  | - Preparation of bar charts for simple construction work |  |  |
|  | 8 |  | - Preparation of bar charts for simple construction work |
|  |  |
| 3rd | 9 |  | - Preparation of schedules for labour, materials, machinery and |  |
|  |  |  | finances for small works |  |  |  |
|  |  |  | - Limitations of bar charts |  |  |  |
|  | 10 |  | - Practice of bar chart preparation |  |  |  |
|  | 11 |  | 2.4 | Scheduling by network techniques |  |  |  |
|  |  |  | - Introduction to network techniques; PERT and CPM, |  |  |
|  | 12 |  | 2.4 Scheduling by network techniques- Differences between PERT and CPM terminologyPractice of CPM |
|  |  |
|  |  |
| 4th | 13 |  | Practice of PERT |  |  |  |
|  | 14 |  | **Revision** |  |  |  |
|  | 15 |  | **3. Organization:** |  |  |  |
|  |  |  | 3.1 | Types of organizations: Line, |  |  |  |
|  | 16 |  | line and staff, Functional and their characteristics |
|  |  |
| 5th | 17 |  | Practice of preparation of organizational chart of an organization. |  |

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|  | 18 | **4. Site Organization:** |
|  |  | 4.1 | Principle of storing and stacking materials at site |
|  | 19 | 4.2 | Location of equipment |
|  | 20 | 4.3 Preparation of actual job layout for a building Practice of job lay-out |
|  |
| 6th | 21 | 4.4 | Organizing labour at site |
|  | 22 | **Revision/Assignment-I** |
|  | 23 | **Sessional Test -I** |
|  | 24 | **5. Construction Labour:** |
|  | 5.1 Conditions of construction workers in India,Wages paid to workers |
|  |
| 7th | 25 | 5.2 | Important provisions of the following Acts: |
|  |  | - Labour Welfare Fund Act 1936 (as amended) |
|  | 26 | - Payment of Wages Act 1936 (as amended) |
|  | 27 | - Minimum Wages Act 1948 (as amended) |
|  | 28 | **Revision/Quarries****6. Control of Progress:** |
|  |
|  | 6.1 | Methods of recording progress |
| 8th | 29 | 6.2 | Analysis of progress |
|  |  | 6.3 | Taking corrective actions keeping head office informed |
|  | 30 | 6.4 | Cost time optimization for simple jobs - Direct and indirect cost, |
|  | 31 | variation with time, cost optimization |
|  | 32 | Practice of Cost Optimization**7. Inspection and Quality Control:** |
|  |
|  |  | 7.1 | Need for inspection and quality control |
| 9th |  33 | 7.2 | Principles of inspection |
|  | 34 | 7.3 | Stages of inspection and quality control for |
|  |  | - Earth work |
|  | 35 | - Masonry |
|  | 36 | - RCC- Sanitary and water supply services |
|  |
| 10th | 37 | **Revision** |
|  | 38 | **8. Accidents and Safety in Construction:** |
|  |  | 8.1 | Accidents – causes and remedies |
|  | 39 | 8.2 | Safety measures for |
|  |  | - Excavation work |
|  | 40 | - Drilling and blasting- Hot bituminous works |
|  |
| 11th | 41 | - Scaffolding, ladders, form work |
|  |  | - Demolitions |
|  | 42 | 8.3 | Safety campaign and safety devices |
|  | 43 | **Revision/Assignment-II, Sessional Test -II** |
|  | 44 | **9. Public Work Accounts:**Introduction, technical sanction, administrative approval, allotment offunds, re-appropriationof funds bill, |
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|  |
| 12th | 45 | Contractor ledger, measurement book, |
|  | 46 | Preparation of bill of quantities (BOQ), |

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|  | 47 | Practice: Preparation of bill of quantities (BOQ), |
|  | 48 | Running and final account bills complete,Practice: MB/running bill/final bill |
|  |
| 13th | 49 | Completion certificate & report, |
|  | 50 | **Revision** |
|  | 51 | Hand receipt, aquittance roll. Muster Roll labour, |
|  | 52 | Casual labour roll-duties and responsibility of different cadres,Budget-stores, returns, account of stock, misc. P.W. advances, |
|  |
| 14th | 53 | T & P – verification, survey report |
|  | 54 | Road metal material charged direct to works, |
|  | 55 | Account - expenditure & revenue head, remittance and deposit head, |
|  | 56 | Definition of cash, precaution in custody of cash book,Imprest account, temporary advance, treasury challan, |
|  |
| 15th | 57 | Preparation of final bills. |
|  | 58 | Preparation of accounts register, stock register. |
|  | 59 | Practice of preparation of: Bills/Accounts Register/Stock Register |
|  | 60 | **Assignment-III** |
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|  Name of the Faculty :  |    |  |  |  |  |
|  Discipline |  : |  Civil Engineering |  |  |  |
| **Semester** | **:** | **6th** |  |  |  |
| **Subject** | **:** | **EMPLOYABILITY SKILLS – II** |  |  |  |
| **Lesson Plan Duration :** | **15 Weeks (from Jan 9-2018 to Apr-2018)** |  |  |  |
|  |  |  |  |  |  |  |
| **Week** |  |  | **Practical** |  |  |  |
|  | **Practical Day** |  | **Topic** |  |  |
| 1st | 1st |  | **Introduction to the Subject and its necessity** |  |  |
| 2nd | 2nd |  | Mock Interview concept and benefits, How to face interview |  |
| 3rd | 3rd |  | Holding Mock interview |  |  |  |
| 4th | 4th |  | **Practical Report Writing** |  |  |
| 5th | 5th |  | **Viva Voce-I** |  |  |  |
| 6th | 6th |  | Preparing for meeting, agenda preparation |  |  |
| 7th | 7th |  | Holding meeting, preparing minute of meeting |  |  |
| 8th | 8th |  | Group discussion – concept, types of group discussion, |  |
| 9th | 9th |  | Preparation for group discussion, |  |  |
| 10th | 10th |  | Holding group discussion as **Viva Voce-II** |  |  |
| 11th | 11th |  | Presentation : Elements of good presentation Structure and tools of |
|  |  |  | presentation, |  |  |  |
| 12th | 12th |  | Paper reading, Seminar preparation |  |  |
| 13th | 13th |  | Holding seminars |  |  |  |
| 14th | 14th |  | **Practical Report Writing** |  |  |
| 15th | 15th |  | Power point presentation as **Viva Voce-III** |  |  |

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| **Name of the Faculty** | **:** |  M.P.SINGH |  |  |  |
| **Discipline** | **:** | **Civil Engineering** |  |  |  |
| **Semester** | **:** | **6th** |  |  |  |
| **Subject** | **:** | **MAJOR PROJECT WORK** |  |  |  |

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| **Lesson Plan Duration :** | **15 Weeks (from Jan-2019 to Apr-2019)** |
|  |  |  |  |  |
| **Week** |  |  |  | **Practical** |
|  | **Practical Day** |  | **Topic** |
| 1st | 1st |  | **Introduction of the project work** |
|  | 2nd |  |  List | of some of the suggested projects |
|  |  |  | -Construction of a Residential House |
|  |  |  | -Rain Water Harvesting |
|  |  |  | - Water Supply system for a one or two villages |
|  |  |  | - Construction of toilets and baths for a shopping complex in a |
|  |  |  | township |
|  |  |  | - Design and construction of septic tank with soak pit for 100 users |
|  |  |  | - Concrete Mix Design |
|  |  |  | - Construction of concrete cubes by mixing appropriate quantity of |
|  |  |  | fly ash with fibres |
|  | 3rd |  | **Necessity/Scope of the project work for the civil engineers** |
|  | 4th |  | Project Work: Estimation and Costing of Residential House |
|  |  |  | (chosen from the list provided) |
| 2nd | 1st |  | Building elements/Quantity surveying |
|  | 2nd |  | Heads of Civil projects works |
|  | 3rd |  | **Revision** |
|  | 4th |  | Specification of various elements of building/civil works - Introduction |
| 3rd | 1st |  | - | Earth Work |
|  | 2nd |  | - | Foundation work |
|  | 3rd |  | - Brick masonry in Foundation |
|  | 4th |  | - CC Work/Damp proofing Course |
| 4th | 1st |  | - | RCC work |
|  | 2nd |  | - Brick masonry in Superstructure |
|  | 3rd |  | - Calculation of steel to be used as reinforcement in columns, |
|  |  |  |  | beams and slabs etc. |
|  | 4th |  | - | Bar bending schedule |
| 5th | 1st |  | - | Centering/shuttering and scaffholding |
|  | 2nd |  | - Curing and its necessity |
|  | 3rd |  |  **Report Writing of Project work** |
|  | 4th |  | - | Plastering/Flooring |
| 6th | 1st |  | - | Finishing Work |
|  |  |  |  | Wood work |
|  | 2nd |  | - | Painting/Distempering |
|  | 3rd |  | - | Doors/windows/ventilation |
|  | 4th |  | - Different accessories used for doors/windows/ventilators fixation |
| 7th | 1st |  | - Testing of construction materials used |
|  | 2nd |  | **Report Writing of Project work** |
|  | 3rd |  | **Viva Voce - I** |
|  | 4th |  | **Designing of the structure:** |
|  |  |  | Designing of the structural components |
| 8th | 1st |  | Designing of the structural components |

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|  | 2nd | Designing of the structural components |
|  | 3rd | Designing of the structural components |
|  | 4th | Designing of the structural components |
| 9th | 1st | Designing of the structural components |
|  | 2nd | Designing of the structural components |
|  | 3rd | Designing of the structural components |
|  | 4th | Designing of the structural components |
| 10th | 1st | Designing of the structural components |
|  | 2nd | Designing of the structural components |
|  | 3rd | **Report Writing of Project work** |
|  | 4th | Estimation of the materials to be used for the construction of the structure |
| 11th | 1st | Estimation of the materials to be used for the construction of the structure |
|  | 2nd | Estimation of the materials to be used for the construction of the structure |
|  | 3rd | Estimation of the materials to be used for the construction of the structure |
|  | 4th | **Viva Voce-II** |
| 12th | 1st | **Report Writing of Project work** |
|  | 2nd | Analysis of rates |
|  | 3rd | Analysis of rates |
|  | 4th | Introduction of Schedule of Rates (CSR-Common Schedule of Rates/ |
|  |  | HSR-Haryana Schedule of Rates/DSR-Delhi Schedule of Rates) |
| 13th | 1st | Preparation of inventory on site |
|  | 2nd | Site/Job-layout |
|  | 3rd | Introduction to low cost materials/low cost housing |
|  | 4th | Introduction to steel structure: welding/riveting |
| 14th | 1st | Preparation of BOQ |
|  | 2nd | Preparation of BOQ |
|  | 3rd | **Report Writing of Project work** |
|  | 4th | Preparation of abstracts of costs |
| 15th | 1st | Preparation of abstracts of costs |
|  | 2nd | **Report Writing of Project work** |
|  | 3rd | **Report Writing of Project work** |
|  | 4th | **Viva Voce-III** |

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| **Name of the Faculty** | **:** |  DHEERAJ SAHNI/PREETI DHAMI |  |  |  |
| **Discipline** | **:** | **Civil Engineering** |  |  |  |
| **Semester** | **:** | **6th** |  |  |  |
| **Subject** | **:** | **REPAIR & MAINTENANCE OF BUILDINGS** |  |  |  |

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| **Lesson Plan Duration :** | **15 Weeks (from Jan 9 -2019 to Apr-2019)** |
|  |  |  |  |
| **Week** |  |  | **Theory** |
|  | **Lecture Day** |  | **Topic (including assignment / test)** |
| 1st | 1 |  | 1.1 Importance and significance of repair and maintenance of buildings |
|  | 2 |  | 1.2 Meaning of maintenance1.3 Objectives of maintenance |
|  |  |  |  |
|  | 3 |  | 1.4 Factors influencing the repair and maintenance |
| 2nd | 1 |  | 2.1 Definition of deterioration/decay |
|  | 2 |  | 2.2 Factors causing deterioration, their classification2.2.1 Human factors causing deterioration  |
|  | 3 |  |  2.2.2 Chemical factors causing deterioration2.2.3 Environmental conditions causing deterioration  |
| 3rd | 1 |  | 2.2.4 Miscellaneous factors2.3 Effects of various agencies of deterioration on various building materials i.e. bricks, timber, concrete, paints, metals, plastics, stones |
|  | 2 |  | 3. Investigation and Diagnosis of Defects 3.1 Systematic approach/procedure of investigation |
|  | 3 |  | 3.2 Sequence of detailed steps for diagnosis of building defects/problems |
|  |  |  | 3.3 List non-destructive and others tests on structural elements |
| 4th | 1 |  | Materials to evaluate the condition of the building and study of three most commonly used tests |
|  | 2 |  | 4. Defects and their root causes (06 hrs)4.1 Define defects in buildings |
|  | 3 |  | 4.2 Classification of defects |
| 5th | 1 |  |  **Test/Assignment-I** |
|  | 2 |  | 4.3 Main causes of building defects in various building elements4.3.1 Foundations, basements and DPC |
|  |  3 |  | 4.3.2 Walls |
|  |  |  |  |
| 6th | 1 |  | 4.3.3 Column and Beams |
|  | 2 |  | 4.3.4 Roof and Terraces |
|  | 3 |  | 4.3.5 Joinery |
| 7th | 1 |  | 4.3.6 Decorative and protective finishes |
|  | 2 |  | 4.3.7 Services |
|  | 3 |  | 4.3.8 Defects caused by dampness |
|  |  |  |  |
| 8th | 1 |  | 5. Materials for Repair, maintenance and protection.5.1 Compatibility aspects of repair materials |
|  | 2 |  | 5.2 State application of following materials in repairs |
|  | 3 |  | 5.2.1 Anti corrosion coatings |
| 9th | 1 |  | 5.2.2 Adhesives/bonding aids  |
|  | 2 |  | . 5.2.3 Repair mortars |
|  |  |  |  |
|  | 3 |  | 5.2.4 Curing compounds |
| 10th | 1 |  | 5.2.5 Joints sealants:  |
|  | 2 |  | **Test/Assignment-II** |
|  | 3 |  | 5.2.6 Waterproofing systems for roofs |
| 11th | 1 |  | 5.2.7 Protective coatings |
|  | 2 |  | 6. Remedial Measures for Building Defects 6.1 Preventive maintenance considerations |
|  | 3 |  | 6.2 Surface preparation techniques for repair6.3 Crack repair methods 6.3.1 Epoxy injection6.3.2 Grooving and sealing |
|  |  |  |  |
| 12th | 1 | 6.3.3 Stitching 6.3.4 Adding reinforcement and grouting 6.3.5 Flexible sealing by sealant |
|  | 2 | 6.4 Repair of surface defects of concrete 6.4.1 Bug holes 6.4.2 Form tie holes 6.4.3 Honey comb and larger voids |
|  | 3 | 6.5 Repair of corrosion in RCC elements 6.5.1 Steps in repairing 6.5.2 Prevention of corrosion in reinforcement |
| 13th | 1 | 6.6 Material placement techniques with sketches 6.6.1 Pneumatically applied (The gunite techniques) 6.6.2 Open top placement 6.6.3 Pouring from the top to repair bottom face |
|  |  |  |
|  | 2 | 6.6.4 Birds mouth 6.6.5 Dry packing 6.6.6 Form and pump 6.6.7 Preplaced – aggregate concrete 6.6.8 Trowel applied method |
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|  | 3 | 6.7 Repair of DPC against Rising 6.7.1 Physical methods 6.7.2 Electrical methods 6.7.3 Chemical methods |
| 14th | 1 | 6.8 Repair of walls 6.8.1 Repair of mortar joints against leakage 6.8.2 Efflorescence removal |
|  | 2 | 6.9 Waterproofing of wet areas and roofs 6.9.1 Water proofing of wet areas |
|  | 3 | 6.9.2 Water proofing of flat RCC roofs 6.9.3 Various water proofing systems and their characteristics |
| 15th | 1 | 6.10 Repair of joints in buildings 6.10.1 Types of sealing joints with different types of sealants |
|  | 2 | 6.10.2 Techniques for repair of joints 6.10.3 Repair of overhead and underground water tanks |
|  | 3 | **Test/Assignment\_III** |