NAME OF FACULTY : **G.F**

DISCIPLINE : **CIVIL ENGG.**

SEMESTER : **5TH**

SUBJECT : HIGHWAY ENGINEERING LESSON PLAN DURATION : **15WEEKS**

WORK LOAD (THEORY/PRACTICAL) PER WEEK (IN HOURS): THEORY-05, PRACTICAL-02

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| **WORKING**  **WEEK** | **WORKING**  **DAY** | **TOPIC TO BE COVER (THEORY)** | **TOPIC TO BE COVER**  **(PRACTICAL)** |
| 1ST | IST | INTRODUCTION | DETERMINATION OF WATER ABSORPTION OF AGGREGATES |
| IIND | IMPORTANCE OF HIGHWAY  ENGINEERING |
| IIIRD | FUNCTION OF IRC, CRRI, MORT&H,  NHAI |
| IVTH | IRC CLASSIFICATION OF ROADS |
| VTH | GLOSSARY OF TERMS USED IN ROAD GEO-METRICS AND THEIR  IMPORTANCE: RIGHT OF WAY |
| 2ND | IST | ROAD MARGIN, ROAD SHOULDER, CARRIAGE WAY, SIDE SLOPES, KERBS, FORMATION LEVELS, CAMBER AND GRADIENT | DETERMINATION OF LOS ANGLES ABRASION VALUE OF AGGREGATE |
| IIND | AVERAGE RUNNING SPEED, STOPPING AND  PASSING SIGHT DISTANCE |
| IIIRD | NECESSITY OF CURVES, HORIZONTAL AND VERTICAL CURVES INCLUDING TRANSITION  CURVES. |
| IVTH | SUPER ELEVATION AND  METHODS OF PROVIDING SUPER ELEVATION |
| VTH | SKETCH OF TYPICAL CROSS- SECTIONS IN CUTTING AND  FILLING ON STRAIGHT ALIGNMENT AND AT A CURVE |
| 3RD | IST | HIGHWAY SURVEYS AND PLAN | DETERMINATION OF IMPACT VALUE OF THE  ROAD AGGREGATE |
| IIND | TOPOGRAPHIC MAP, READING THE DATA GIVEN ON A TOPOGRAPHIC  MAP |
| IIIRD | BASIC CONSIDERATIONS GOVERNING  ALIGNMENT FOR A ROAD IN PLAIN  AND HILLY AREA |
| IVTH | HIGHWAY LOCATION; MARKING OF  ALIGNMENT |
| VTH | TOPOGRAPHIC MAP, READING  THE |

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|  |  | DATA GIVEN ON A TOPOGRAPHIC  MAP |  |
| 4TH | IST | ROAD MATERIALS | RIVISION OF PRACTICAL NO. 1 |
| IIND | DIFFERENT TYPES OF ROAD MATERIALS IN USE; SOIL, AGGREGATE, BINDERS – BITUMEN,  CUTBACK, EMULSION AND  MODIFIED BITUMEN (CRMB, PMB) |
| IIIRD | BINDERS: COMMON BINDERS; BITUMEN, PROPERTIES AS PER BIS SPECIFICATIONS,  PENETRATION |
| IVTH | SOFTENING POINT, DUCTILITY  AND VISCOSITY TEST OF BITUMEN, PROCEDURES |
| VTH | CUT BACK AND EMULSION AND THEIR USES,  BITUMEN MODIFIERS |
| 5TH | IST | DOUBT OF UNIT 1ST AND 2ND WILL BE TAKEN. | RIVISION OF PRACTICAL NO. 2 |
| IIND | ROAD PAVEMENTS |
| IIIRD | ROAD PAVEMENT: FLEXIBLE AND RIGID PAVEMENT, THEIR MERITS AND DEMERITS,  TYPICAL CROSS-SECTIONS |
| IVTH | INTRODUCTION TO CALIFORNIA BEARING RATIO, METHOD OF FINDING CBR VALUE AND ITS  SIGNIFICANCE |
| VTH | SUB-GRADE PREPARATION: SETTING OUT ALIGNMENT OF ROAD, SETTING OUT BENCH MARKS, CONTROL PEGS FOR  EMBANKMENT AND CUTTING |
| 6TH | IST | INTRODUCTION TO SUB BASE  COURSE AND BASE COURSE | RIVISION OF PRACTICAL NO. 3 |
| IIND | GRANULAR BASE COURSE: (I) WATER BOUND MACADAM (WBM)  (II) WET MIX MACADAM  (WMM) |
| IIIRD | BITUMEN COURSES: (I) BITUMINOUS MACADAM (II) DENSE BITUMINOUS  MACADAM (DBM) |
| IVTH | MEANING, CONDITIONS/SITUATIONS OF OCCURRENCE WITH EMPHASIS ON PRACTICAL  SIGNIFICANCE OF |
| VTH | \*METHODS OF CONSTRUCTION AS  PER MORT&H |
| 7TH | IST | SURFACING: A) \* TYPES OF  SURFACING | DETERMINATION OF  THE CALIFORNIA |

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|  |  | 1. PRIME COAT AND TACK COAT 2. SURFACE DRESSING WITH SEAL   COAT | BEARING RATIO |
| IIND | METHODS OF CONSTRUCTIONS  AS PER MORT&H SPECIFICATIONS AND QUALITY CONTROL |
| IIIRD | RIGID PAVEMENTS: |
| IVTH | CONSTRUCTION OF CONCRETE ROADS AS PER IRC SPECIFICATIONS: FORM WORK LAYING, MIXING AND PLACING THE  CONCRETE |
| VTH | COMPACTING AND FINISHING, CURING,  JOINTS IN CONCRETE PAVEMENT,  EQUIPMENT USED |
| 8TH | IST | DOUBT OF UNIT 3RD AND 4TH WILL  BE TAKEN. | (CBR) FOR THE SUB- GRADE SOIL |
| IIND | INTRODUCTION: TYPICAL CROSS- SECTIONS SHOWING ALL DETAILS OF A TYPICAL HILL ROAD, PARTLY IN CUTTING AND  PARTLY IN FILLING |
| IIIRD | SPECIAL PROBLEMS OF HILL  AREAS |
| IVTH | ROAD DRAINAGE |
| VTH | NECESSITY OF ROAD DRAINAGE  WORK, CROSS DRAINAGE WORKS |
| 9TH | IST | SURFACE AND SUBSURFACE DRAINS AND STORM WATER DRAINS. LOCATION, SPACING  AND TYPICAL | VISIT TO HOT MIX PLANT |
| IIND | SIDE DITCHES FOR SURFACE DRAINAGE.  INTERCEPTING DRAINS, PIPE  DRAINS IN HILL ROADS, |
| IIIRD | ROAD MAINTENANCE |
| IVTH | COMMON TYPES OF ROAD FAILURES OF FLEXIBLE PAVEMENTS: POT HOLE, RUTTING,  ALLIGATOR CRACKING |
| VTH | MAINTENANCE OF BITUMINOUS |
| 10TH | IST | ROAD SUCH AS SEAL-COAT, PATCH- WORK AND RE  CARPETING | DUCTILITY OF BITUMEN |
| IIND | MAINTENANCE OF CONCRETE ROADS-FILLING CRACKS, REPAIRING JOINTS, MAINTENANCE  OF SHOULDERS (BERMS),  MAINTENANCE OF  TRAFFIC CONTROL DEVICES |
| IIIRD | DOUBT OF UNIT 5TH AND 6TH WILL |

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|  |  | BE TAKEN. |  |
| IVTH | TEST OF UNIT 1ST AND 2ND. |
| VTH | ROAD CONSTRUCTION EQUIPMENT OUTPUT AND USE OF THE FOLLOWING PLANT AND  EQUIPMENT |
| 11TH | IST | HOT MIX PLANT | PENETRATION OF BITUMEN |
| IIND | TIPPER, TRACTORS (WHEEL AND CRAWLER) SCRAPER, BULLDOZER, DUMPERS, SHOVELS,  GRADER, ROLLER, DRAGLINE |
| IIIRD | ASPHALT MIXER AND TAR BOILERS |
| IVTH | ROAD PAVERS |
| VTH | DOUBT OF UNIT 7TH AND 8TH WILL BE TAKEN. |
| 12TH | IST | TEST OF UNIT 3RD AND 4TH. | SOFTENING POINT TEST OF BITUMEN |
| IIND | AIRPORT ENGINEERING NECESSITY OF STUDY OF AIRPORT ENGINEERING, AVIATION TRANSPORT  SCENARIO IN INDIA. |
| IIIRD | DOUBT OF UNIT 9TH WILL BE  TAKEN. |
| IVTH | TEST OF UNIT 5TH AND 6TH. |
| VTH | FACTORS TO BE CONSIDERED WHILE SELECTING A SITE FOR AN AIRPORT WITH RESPECT TO  ZONING LAWS. |
| 13TH | IST | TEST OF UNIT 5TH AND 6TH | VISIT TO HIGHWAY CONSTRUCTION SITE FOR DEMONSTRATION  OF OPERATION OF  TIPPER, TRACTORS (WHEEL AND CRAWLER), SCRAPER, BULLDOZER, DUMPERS, SHOVELS, GRADER,  ROLLER, DRAGLINE,  ROAD PAVERS, JCB ETC. |
| IIND | INTRODUCTION TO RUNWAYS,  TAXIWAYS AND APRON |
| IIIRD | DOUBT OF 10TH WILL BE TAKEN. |
| IVTH | TEST OF UNIT 7TH. |
| VTH | REVISION OF UNIT 1ST AND 2ND. |
| 14TH | IST | TEST OF UNIT 8. | MIXING AND SPRAYING EQUIPMENT |
| IIND | RIVISION OF UNIT 3RD AND 4TH. |
| IIIRD | TEST OF UNIT 9TH. |
| IVTH | REVISION OF UNIT 4TH AND 5TH |
| VTH | OBJECTIVE TYPE QUESTIONS |
| 15TH | IST | TEST OF UNIT 10TH. | A VISIT  TO READY MIX CONCRETE PLANT. |
| IIND | RIVISION OF UNIT 5TH AND 6TH. |
| IIIRD | REVISION OF UNIT 7TH |
| IVTH | REVISION OF UNIT 8TH |
| VTH | REVISION OF UNIT 9TH AND 10TH |