TEACHING SCHEME AND SYLLABUS OF

M.E.-(CIVIL)

(TRANSPORTATION ENGINEERING)

CIVIL ENGINEERING DEPARTMENT
L. D. COLLEGE OF ENGINEERING
AHMEDABAD.

GUJARAT UNIVERSITY

TEACHING AND EXAMINATION SCHEME FOR M.E. (CIVIL)

IN

TRANSPORTATION ENGINEERING

PAPER NO.	COURSE TITLE	TEACHING			SESS MARKS	THEORY MARKS	EXAM. MARKS	TERM WORK MARKS	VIVA/ PRACT. MARKS	TOTAL MARKS
		L	T	P						
SEMESTER - I										
MEC-T 101	URBAN TRANSPORTATION SYSTEM PLANNING	4	2	-	50	100	3	25	25	200
MEC-T 102	TRAFFIC SURVEYS & ANALYSIS	4	-	2	50	100	3	25	25	200
MEC-T 103	SYSTEM ENGINEERING	4	2	-	50	100	3	25	25	200
MEC-T 104	APPLIED STATISTICS & PROBABILITY	4	-	-	50	100	3	-	-	150
MEC-T 105	COMPUTER PROGRAMMING	4	-	2	50	100	3	25	25	200
MEC-T 106	SEMINAR	-	2	-	50	-	-	-	-	50
TOTAL ---------->		20	6	4	300	500	-	100	100	1000
SEMESTER -II										
MEC-T 201	REGIONAL AND RURAL TRANSPORTATION SYSTEM PLANNING	4	2	-	50	100	3	25	25	200
MEC-T 202	HIGHWAY MATERIALS AND CONSTRUCITON	4	-	2	50	100	3	25	25	200
MEC-T 203	PAVEMENT DESIGN AND EVALUATION	4	-	2	50	100	3	25	25	200
MEC-T 204	ECONOMICS AND EVA. OF TRANSPORATION PROJECT	4	-	-	50	100	3	-	-	150
MEC-T 205	TRAFFIC ENGINEEPING	4	-	2	50	100	3	25	25	200
MEC-T 206	PROJECT	-	2	-	50	-	-	-	-	50
TOTAL ---------->		20	6	4	300	500	-	100	100	1000
SEMESTER - III										
DISSERTATION		-	20	-	-	-	-	300	200	500

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M.E. (CIVIL) TRANSPORTATION ENGINEERING

SPLIT SYSTEM SUBJECT DISTRIBUTION (DURATION SIX SEMESTERS)

PART	SEMESTER	SUBJECT NO.	T O P I C
A	I	MEC-T-101	URBAN TRANSPORTATION SYSTEM PLANNING
		MEC-T-102	TRAFFIC SURVEY & ANALYSIS
		MEC-T-103	SYSTEM ENGINEERING
A	II	MEC-T-201	REGINAL AND RURAL TRANSPORTATION SYSTEM PLANNING
		MEC-T-202	HIGHWAY MATERIALS AND CONSTRUCTION
		MEC-T-203	PAVEMENT DESIGN AND EVALUATION
B	III	MEC-T-104	APPLIED STATISTICS AND PROBABILITIES
		MEC-T-105	COMPUTER PROGRAMMING
		MEC-T-106	SEMINAR
B	IV	MEC-T-204	ECONOMICS AND EVALUATION OF TRANSPORTATION PROJECT
		MEC-T-205	TRAFFIC ENGINEERING
		MEC-T-206	PROJECT
	Vth & VIth		DISSERTATION

NOTE : THE DETAILS OF TEACHING AND EXAMINATION SCHEME ARE THE SAME AS THOSE PROVIDED FOR FULL TIME COURSE.

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MEC-T 101 URBAN TRANSPORTATION SYSTEMS PLANNING

TEACHING SCHEME			EXAMINATION SCHEME					TOTAL MARKS
THEORY	LAB/ PRACT.	TUTO-RIAL	THEORY MARKS	PAPER HRS.	SESSIONAL MARKS	T W. MARKS	VIVA PRACT	
		2	100	3	50	25	25	200

INTRODUCTION TO TRANSPORTATION SYSTEMS PLANNING, OF TRANSPORTATION. VARIOUS MODES AND COMPARISION.

2. PLANNING METHODOLOGIES, MODELLING TECHNIQUES IN PLANNING, PROBLEM SOLVING TECHNIQUES.

3. URBAN TRANSPORTATION PLANNING MODELS, TRIP GENERATION, TRIP DISTRIBUTION, MODAL SPLIT ANALYSIS, TRIP ASSIGNMENT TECHNIQUES, AND VARIOUS MODELS.

4 NETWORK ASSIGNMENT METHODS, CONNECTIVITY.

5 LANDUSE PLANNING MODELS AND THEIR SUITABILITY.

6 URBAN GOODS MOVEMENT.

TUTOTRIALS :

PROBLEMS BASED ON TRIP GENERATION, TRIP DISTRIBUTION MODAL SPLIT ANALYSIS, TRIP ASSIGNMENT, NETWORK ASSIGNEMENT, CONNECTIVITY, LAND USE PLAN.

REFERENCES :

(1) INTRODUCTION TO URBAN TRANSP. SYS. PLANNING - B.G.HUTCHINSON.
(2) TRANSP. ENGG. AND PLANNING - EDWARD K. MORLOK
(3) METROPOLITAN TRANSP. PLANNING - DICKEY
(4) LANDUSE TRANSP. SYSTEM - BLUNDER AND BLACK
(5) URBAN PUBLIC TRANSPORT - VACAN R. VUCHICK

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MET-T 102 APPLIED STATISTICS AND PORBABILITY

TEACHING SCHEME			EXAMINATION SCHEME					TOTAL MARKS
THEORY	LAB/ PRACT	TUTO-RIAL	THEORY MARKS	PAPER HRS.	SESSIONAL MARKS	T.W MARKS	VIVA PRACT	
4	2	-	100	3	50	25	25	200

1. INTRODUCTION, BASIC COMPONENTS AND THEIR CHARACTERISTICS.

2. FUNDAMENTAL VARIABLES OF TRAFFIC - VOLUME, SPEED, DELAY, DENSITY, HEADWAY,MEASUREMENT TECHNIQUES AND ANALYSIS.

3. INVENTORY SURVEY ,TRANSPORTATION SURVEY, ORIGIN AND DESTINATION SURVEY, TRAFFIC COUNT SURVEY ,INTERSECTION TRAFFIC FLOW SURVEY - METHODOLOGY AND ANALYSIS.

4. PARKING SURVEY CHARACTERISTICS AND INTERPRETATION.

5. ROAD ACCIDENTS AND SAFETY MEASURES.

6. TRAFFIC PLANNING AND DESIGN FOR PEDESTRIANS, INTERSECTIONS ROAD MARKINGS, SIGNS.

7. TRAFFIC FORECASTING TECHNIQUES.

PRACTICALS :

DRIVERS'S STABILITY TEST , VEHICULAR CHARACTERISTICS, TRAFFIC VOLUME STUDY WITH USE OF HANDICOUNT TAPE, VIDEORECORDER METER.

SPOT SPEED STUDY WITH RADAR METER , ENOSCOPE, TRAVEL TIME AND DELAY STUDY, PARKING SURVEY, PEDESTRIAN FLOW SURVEY, INTERSECTION VOLUME STUDY, STOPPED DELAY, TRAVEL TIME DELAY, SATURATION FLOW, ANALYSIS OF ROAD ACCIDENT.

REFERENCES :

(1) TRAFFIC ENGG. - L.J.PIGNATARO
(2) TRAFFIC ENGG. - W.R.MCSHANE AND R.P.RPSS
(3) TRAFFIC SYSTEM ANALYSIS FOR ENGRS. AND PLANNING - WOHL & MARTIN.
(4) TRAFFIC CONTROL THEORY - DONALD AND DREW.

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MEC-T 103 SYSTEMS ENGINEERING

TEACHING SCHEME			EXAMINATION SCHEME					TOTAL MAKRS
THEORY	LAB./ PRACT.	TUTO-RIAL	THEORY MARKS	PAPER HRS.	SESS. MARKS	T.W. MARKS	VIVA PRACT.	
4	-	2	100	3	50	25	25	200

1. INTRODUCTION - QUANTITATIVE METHODS FOR MANAGEMENT DECISIONS, OPERATION RESEARCH.

2. LINEAR PROGRAMMING - PROBLEMS, GRAPHICAL SOLUTION.

   SIMPLEX METHOD, DUALITY, POST-OPTIMALITY ANALYSIS.

4. TRANSPSORTATION AND TRANSHIPMENT PROBLEMS.

5. ASSIGNMENT PROBLEMS.

6. QUEING THEORY

7. NETWORK MODELS, SHORTEST PATH METHOD, MAXIMUM FLOW, MINIMUM SPANNING TREE PROBLEM.

8. INTEGER PROGRAMMING, GOAL PROGRAMMING, DYNAMIC PROGRAMMING, NON LINEAR PROGRAMMING.

9. DECISION THEORY.

TORIALS :

BASED ON ABOVE SYLLABUS.

REFERENCES :

(1) OPTIMISATION THEROY AND APPLICATIONS - S.S. RAO (WE)
(2) QUANTITATIVE TECHNIQUES IN MANAGEMENT - N.D.VORA
(3) FOUNDATIONS OF OPTIMIZATION - BEIGHTLER PHILIPS, WILDE(PHI).

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MEC-T 105 COMPUTER PROGRAMMING

TEACHING SCHEME			EXAMINATION SCHEME					TOTAL MARKS
THEORY	LAB./ PRACT.	TUTO-RIAL	THEORY MARKS	PAPER HRS.	SESS. MARKS	T.W. MARKS	VIVA PRACT.	
4	2	-	100	3	50	25	25	200

1. PROGRAMMING IN C^{++} LANGUAGE, MATRIX, OPERATIONS.

2. SIMULATION.

3. PROGRAMMING FOR SIMPLEX METHOD, TRANSPORTATION PROBLEM, SHORTEST PATH METHOD. TRIP GENERATION AND TRIP DISTRIBUTION MODELS, MOORE'S ALGORITHM.

4. APPLICATIONS OF c^{++} PROGRAMMING IN GRAPHICS.

5. MS OFFICE APPLICATIONS, GENERATION OF BEST FIT CURVES, DIGITIZATION OF MAPS.

TUTORIALS :

PRACTICE OF PACKAGES AND PROGRAMMES BASED ON ABOVE SYLLABUS.

REFERENCES :

(1) PROGRAMMING ANSI. 'C' - BALAGURUSWAMI

(2) PROGRAMMING IN C^{++} - BALAGURUSWAMI

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MEC-T 106 SEMINAR

TEACHING SCHEME			EXAMINATION SCHEME					TOTAL MARKS
THEORY	LAB./ PRACT.	TUTO-RIAL	THEORY MARKS	PAPER HRS.	SESS. MARKS	T.W. MARKS	VIVA PRACT.	
-	-	2	-	-	50	-	-	50

SEMINAR WILL BE BASED ON RECENT TOPICS IN TRANSPORTATION ENGINEERING.

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MEC-T 201 REGIONAL AND RURAL TRANSPORTATION SYSTEMS PLANNING

TEACHING SCHEME			EXAMINATION SCHEME					TOTAL MARKS
THEORY	LAB./ PRACT	TUTO-RIAL	THEORY MARKS	PAPER HRS.	SESS. MARKS	T.W. MARKS	VIVA PRACT.	
4	-	2	100	3	50	25	25	200

1. INTRODUCTION - REGIONAL DEVELOPMENT, FACTORS, POPULATION FORECASTING METHODS.

2. INPUT-OUTPUT ANALYSIS, VEHICLE OWNERSHIP MODELLING, REGIONAL HIGHWAY TRAFFIC MODEL, SPATIAL INTERACTION MODELS, SHOPPING MODEL, LAND USE MODELS.

3. NETOWRK PLANNING, 20 YEARS PLANNING OF ROADS BY DIFFERENT METHODS.

4. REGIONAL PLANNING - DIFFERENT THEORIES, CONCENTRIC RING, CENTRAL PLACE GROWTH POLE, DELINEATION, NODAL POINTS.

5. BENEFITS FROM PLANNING - MEASUREMENTS OF TRANSPORTATION PARAMETERS.

TUTORIALS :

BASED ON ABOVE SYLLABUS.

REFERENCES :

(1) APPLIED MODELS IN URBAN AND REGIONAL ANALYSIS - OPPENHEIM N. PRENTICE HALL 1980
(2) ANALYTICAL MODELS FOR URBAN AND REGIONAL PLANNING DAVID AND CHALSE LONDON 1972.
(3) PLANNING AND DEVELOPMENT OF TOWNS- R.G.GUPTA.
(4) REGIONAL PLANNING - MISHRA AND SUNDERAM.

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MEC-I 202 HIGHWAY MATERIALS AND CONSRUCTION

TEACHING SCHEME			EXAMINATION SCHEME					TOTAL MARKS
THEORY	LAB./ PRACT	TUTO-RIAL	THEORY MARKS	PAPER HRS.	SESS. MARKS	T.W. MARKS	VIVA PRACT	
4	2		100	3	50	25	25	200

1. SOIL PROPERTIES, CLASSIFICTION, COMPACTION, CONSOLIDATION, APPLICATION OF TESTS, RESUILS AND USE OF GEOTEXTILE.

2. SOIL STABILIZATION - METHODS, PRINCIPLES, TEST SIGNIFICANCE, DESIGN OF SOIL-STABILIZED MIX, CONTROL.

   AGGREGATES : TYPES, TESIS, DESIRED PROPERTIES, AGGREGATE BLENDING METHODS.

4. BITUMENOUS MATERIALS - TYPES, TESTS, PROPERKTIES, BLENDING.

5. BITUMINOUS MIX, DESIGN TEST RESULTS, CONTROL.

6. CEMENT CONCRETE MIX DESIGN ADMIXTURES, TESTS, RESULTS, CONTROL.

7. HIGHWAY CONSTRUCTION METHODS : EMBANKMENT, SUB-BASE, BASE AND SURFACE COURSES, FLEXIBLE PAVEMENTS, RIGID PAVEMENTS.

8. SURFACE AND SUBSURFACE DRAINAGE

9. ROAD WORK IN DESERT, SWAMPY, HILLY AREA IN PROBLEMATIC SITUATION.

10. APPLICATION OF GEO SYNTHETICS HIGHWAY OF CONSTRUCTION.

PRACTICALS :

SOIL COMPACTION, TEST CBR TEST, BITUMINOUS MIXDESIGN BY MARSHALL'S METHOD, SOIL-LIME, SOIL-CEMENT, SAND-BITUMIN, BLACK COTION SOIL - LIME STABILIZATION.

REFERENCES

(1) ASPHALT PAVEMENT ENGG. WALKER AND MARTIN
(2) HIGHWAY MATERIALS KERBS AND WALKER
(3) SOIL MECHANICS FOR ROAD ENGINEER - HMSO
(4) BITUMINOUS MATERIALS FOR ENGINEER - HMSO

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MET-T 203 APPLIED STATISTICS AND PORBABILITY

TEACHING SCHEME			EXAMINATION SCHEME					TOTAL MARKS
THEORY	LAB/ PRACT	TUTO-RIAL	THEORY MARKS	PAPER HRS.	SESSIONAL MARKS	T.W MARKS	VIVA PRACT	
4	2	-	100	3	50	25	25	200

1 TYPES OF PAVEMENTS - RIGID , FLEXIBLE, HIGHWAY, RUNWAY COMPARISION.

2 TYPES OF FAILURES.

3 STRESSES IN FLEXIBLE PAVEMENTS - THEORIES, ANALYSIS.

4 STRESSES IN RIGID PAVEMENTS - THEORIES, ANALYSIS.

5 DESIGN OF FLEXIBLE PAVEMENTS - EWLF, TYRE PRESSURE, OTHER FACTORS,VARIOUS METHODS FOR HIGHWAYS AND RUNWAYS DESIGN.

6 DESIGN OF RIGID PAVEMENTS - EWLF, OTHER FACTORS, VARIOUS METHODS FOR HIGHWAYS AND RUNWAYS , DESIGN OF JOINTS, PRESTRESSED CONCRETE PAVEMENTS.

PRACTICALS :

PLATE BEARING TEST , FIELD C.B.R TEST , PAVEMENT EVALUATION BY BENKLEMEAN BEAM METHOD, ROAD UNENENESS MEASUREMENT BY ROUGHOMETER,EVALUATION OF PAVEMENT ROUGHNESS BY PROFILOMETER DESIGN OF FLEXIBLE , RIGID PAVEMENT FOR HIGHWAY AND RUNWAY.

REFERENCES :

(1) PRINCIPLES OF PAVEMENT DESIGN. - YODER AND WITZECK
(2) PAVEMENT DESIG. - TANG
(3) PRINCIPLES OF PRACTICE OF HIGHWAY ENGG. - SHARMA & SHARMA
(4) IRC-37, 1984, IRC-58-1988.