PERIYAR UNIVERSITY

SALEM – 636 011

PERIYAR INSTITUTE OF DISTANCE EDUCATION (PRIDE)

DIPLOMA IN TRAFFIC EDUCATION AND ROAD SAFETY

ONE YEAR

REGULATION AND SYLLABUS

(Effective from the Academic Year 2015 - 2016)

ACADEMIC ELIGIBILITY FOR ADMISSION

Diploma in Traffic Education And Road Safety: +2 (10 + 2 Stream), Diploma, any Graduate

DURATION OF COURSE: One Year

COURSE OF STUDY AND SCHEME OF EXAMINATIONS:

Sl.No	Title Of The Subject	Duration	Maximum Marks
1.	Transportation Planning	3 Hours	100
2.	Traffic Education	3 Hours	100
3.	Road Safety System	3 Hours	100
4.	Environmental Impact Assessment Of Transportation Projects	3 Hours	100
5.	Transport Economics & Management	3 Hours	100
		Total Marks	500

PASSING CRITERIA: The candidates shall be declared to have passed the examination, if they secure not less than 40 marks in each examination.

QUESTION PAPER PATTERN:

THEORY

Duration : 3 Hours Maximum Marks : 100

Part – A (5 x 5 = 25 Marks)

Answer any 5 Questions

(Eight Questions to be asked)

1, 2, 3, ….8.

Part – B (5 x 15 = 75 Marks)

Answer any 5 Questions

(Eight Questions to be asked)

1, 2, 3, ….8.

PERIYAR UNIVERSITY (PRIDE)
DISTANCE EDUCATION

DIPLOMA IN TRAFFIC EDUCATION AND ROAD SAFETY

PAPER I: TRANSPORTATION PLANNING

OBJECTIVE:

The objective of the course is to educate the students on the various components of Highway and Transportation Planning. It exposes the students to highway planning and surveys for highway alignment, Geometric Elements of Highways and Urban roads, Rigid and Flexible pavements design. This course enables the students to develop skill on evaluation of the pavements and to decide appropriate types of maintenance.

UNIT I: INTRODUCTION

History of Road construction, Highway development in India – Jayakar Committee Recommendations and Realizations, Twenty Year Road Development Plans – Indian Roads Congress- Highway Research Board , National Highway Authority of India, Ministry Of Road Transport and Highways(MORTH), Central Road Research Institute.

UNIT II: HIGHWAY ALIGHNMENT

Requirements of ideal alignment – Factors controlling highway alignment, Engineering Surveys for Alignment – Classification and Cross section of Urban and Rural roads.

UNIT III: HIGHWAY CROSS SECTIONAL ELEMENTS

Right of way , Carriageway , Camber, Kerbs, Shoulders, Footpath, Cross section of different class of roads, Design of horizontal alignment – Horizontal curves, Super elevation, Widening of pavements on Horizontal Curves and Transition Curves, Design of Vertical Alignment – Rolling , Limiting , Exceptional and Minimum gradients, Summit and Valley curves

UNIT IV: SIGHT DISTANCES

Factors affecting Sight Distance , PIEV Theory, Stopping Sight Distance (SSD), Overtaking Sight Distance(OSD), Sight Distance at Intersection, Intermediate Sight Distance- Problems in SSD and OSD. Geometric Design of Hill roads (IRC standards only)

UNIT V: FLEXIBLE AND RIGID PAVEMENTS & HIGHWAY MAINTENANCE

Rigid and Flexible pavements, Factors affecting Design of pavements – ESWL, Climate, Sub-grade Soil, Types of Defects in Flexible pavements – Surface defects, Cracks, Deformation, Disintegration, Symptoms , Causes and Treatments , Types of Pavement, failures in Rigid Pavements, Scaling, Shrinkage, Warping , Structural Cracks, Spalling of Joints and Mud Pumping and Special Repairs.

OUTCOME:

Students would be aware of the various components of the Highway and Transportation Planning, Basic Principles and Design, Planning and Management of Transportation System.

TEXT BOOKS:

1.Khanna K and Justo CEG, Highway Engineering, Khanna Publishers, Roorkee 2001.

2. Kadiyali, L.R., "Traffic Engineering and Transport Planning", Khanna Publishers, Delhi, 2002

REFERENCES:

1. Wolfgang S.Homburger et.al., "Fundamentals of Traffic Engineering" 15th Edition, Institute of Transportation Studies, University of California, Berkely, 2001

2. James L.Pline (Edr)„ "Traffic Engineering Hand Book", Institute of Transportation Engineers, Washington DC, USA, 1999

3. Nicholas T.Garber, Lester A Hoel, "Traffic and Highway Engineering", Revised Second Edition, ITP, California, USA, 1999

4. Thomas Curinan, "An Introduction to Traffic Engineering – A Manual for Data Collection and Analysis", Books Cole, UK, 2001

5. Kadiyali, L.R., "Traffic Engineering and Transport Planning", Khanna Publishers, Delhi, 2002

6. IRC Standards (IRC 37 - 2001 & IRC 58 -1998)

7. Bureau of Indian Standards (BIS) Publications on Highway Materials

8. MORTH Guidelines for Highway Engineering

9. Subramani,T. and Elangovan, R “Planning Of A Ring Road Formation For Salem Corporation Using GIS”, International Journal of Engineering Research And Industrial Applications, Vol.5, No.II, pp 109-120, 2012.

10. Subramani, T “Assessment Of Potential Impacts On NH7 – 4 Laning From Salem To Karur”, International Journal of Modern Engineering Research, Vol.2, No.3, pp 707-715, 2012.

11. Subramani,T and Nandakumar,S, “National Highway Alignment Using GIS” International Journal of Engineering Research and Applications, Vol.2, Issue.4, pp 427-436, 2012.

12. Subramani,T and Malaisamy.P, “Design of Ring Road For Erode District Using GIS”, International Journal of Modern Engineering Research,Vol.2, No.4, pp 1914 - 1919, 2012.

13. Subramani,T, Krishnan.S. And Kumaresan.P.K., Study on Existing Traffic condition in Salem City and Identify the Transport Facility Improvement Projects, International Journal of Applied Engineering Research IJAER, Vol.7,No.7, Pp 717 – 726, 2012.

14. Subramani.T, Krishnan.S, Kathirvel.C, Bharathi Devi.S.K, “National Highway Alignment from Namakkal to Erode Using GIS” , International Journal of Engineering Research and Applications ,Vol. 4, Issue 8(Version 6), pp.79-89, 2014.

15. Subramani.T, Sivagnanam.M , " Suburban Changes In Salem By Using Remote Sensing Data" , International Journal of Application or Innovation in Engineering & Management (IJAIEM) , Volume 4, Issue 5, May 2015 , pp. 178-187 , ISSN 2319 - 4847. 2015

16. Subramani.T, Sekar.M , " Preplanning And Scheduling Of Road Construction By Using PPM" , International Journal of Application or Innovation in Engineering & Management (IJAIEM) , Volume 4, Issue 5, pp. 234-244 , 2015

17. Subramani.T, Pari.D, “Highway Alignment Using Geographical Information System”, IOSR Journal of Engineering, Volume 5 ~ Issue 5 , Version 3, pp 32-42, 2015

PAPER II: TRAFFIC EDUCATION

OBJECTIVE:

Provides a basic understanding on Traffic Education – Planning, Design, Operation and Management

UNIT I: TRAFFIC CHARACTERISTICS

Road Characteristics, Road User characteristics - Physical, Physiological, Environmental Characteristics, Traffic stream Characteristics, Vehicle characteristics – Static and Dynamic, Urban road and Rural road Characteristics

UNIT II: SURVEYS AND STUDIES IN TRAFFIC ENGINEERING

Traffic Surveys and studies – Volume and Capacity – Headway concepts and applications – Speed and Delay, Origin and Destination, Parking, Accident-Level of Services (LOS)

UNIT III: DESIGN OF TRANSPORT INFRASTRUCTURE

Design of Cycle Tracks, Pedestrian Facilities, Networking Pedestrian Facilities and Cycle tracks, Parking Facilities - On Street, Off Street and Multi level, Street Lighting.

UNIT IV: ROAD INTERSECTION

At Grade Intersection – Uncontrolled , Channelization, Rotary, Traffic Signal Control, Signal Co - Ordination, Grade Separated Intersection and Types.

UNIT V: TRAFFIC OPERATION

Traffic Sign, Road Markings, Traffic Control Aids , Hand Signals and Driving Techniques, Traffic Regulation,

OUTCOME:

Students would be aware of the basic Principles and Design, Planning and Traffic operation of Transportation system.

TEXT BOOKS:

1. Kadiyali, L.R., "Traffic Engineering and Transport Planning", Khanna Publishers, Delhi, 2002

2. Khanna K and Justo CEG, Highway Engineering, Khanna Publishers, Roorkee 2001

REFERENCES:

1. Wolfgang S.Homburger et.al., "Fundamentals of Traffic Engineering" 15th Edition, Institute of Transportation Studies, University of California, Berkely, 2001.

2. James L.Pline (Edr)„ "Traffic Engineering Hand Book", Institute of Transportation Engineers, Washington DC, USA, 1999

3. Nicholas T.Garber, Lester A Hoel, "Traffic and Highway Engineering", Revised Second Edition, ITP, California, USA, 1999

4. Thomas Curinan, "An Introduction to Traffic Engineering – A Manual for Data Collection and Analysis", Books Cole, UK, 2001

5. Indian Roads Congress (IRC) specifications: Guidelines and special publications on Traffic Planning and Management

6. Guidelines of Ministry of Road Transport and Highways, Government of India.

7. Subramani, T. "Parking Study On Main Corridors In Major Urban Centre", International Journal of Modern Engineering Research, Vol.2, No. 3, pp 742-748, 2012.

8. Subramani, T "Assessment Of Potential Impacts On NH7 – 4 Laning From Salem To Karur", International Journal of Modern Engineering Research, Vol.2, No.3,pp 707-715, 2012.

9. Subramani, T. "Pedestrian Study on Road links in Major Urban Centre", IOSR Journal of Engineering, Vol.2, No. 4, pp 750-754, 2012.

10. Subramani, T. "Parking Study On Main Corridors In Major Urban Centre", International Journal of Modern Engineering Research, Vol.2, No. 3, pp 742-748, 2012.

11. Subramani, T. “Study of Pollution Prevention Strategies For Reclamation of Ooty Lake” International Journal of Engineering Research and Applications, Vol.2, Issue.3, pp 783-791, 2012

12. Subramani,T, Krishnan.S. And Kumaresan.P.K., “Study on Existing Traffic condition in Salem City and Identify the Transport Facility Improvement Projects”, International Journal of Applied Engineering Research IJAER, Vol.7,No.7, Pp 717 – 726, 2012.

13. Subramani.T, Arutselvan.S, Ganesan.S.K , “Analysis Of Highway Air Pollution” International Journal of Engineering Research and Applications, Volume. 4, Issue. 6 (Version 5), pp 173 - 182, 2014.

14. Subramani.T, Sivagnanam.M , “Suburban Changes In Salem By Using Remote Sensing Data” , International Journal of Application or Innovation in Engineering & Management (IJAIEM) , Volume 4, Issue 5, May 2015 , pp. 178-187 , ISSN 2319 - 4847. 2015

PAPER III: ROAD SAFETY SYSTEM

OBJECTIVES:

Helps in identifying the reasons for Road Accidents and Scientific Investigation. Provides knowledge on safety audit and its methodology

UNIT I: DESCRIPTION OF PROBLEMS

Causes of Accidents – Human Factors – Vehicles – Road and its Condition – Environmental Studies.

UNIT II: ACCIDENT ANALYSIS TECHNIQUES

Collision Diagram – Preparation, Spatial Analysis of accidents – Methods and GIS in Accident Analysis – Black Spot Black Route and Area Identification.

UNIT III: BEFORE AND AFTER STUDIES

Accident Prediction Model – Development – Empirical Bayees Approach – Before and After Evaluation – Case Studies, Accident Prevention Study over Human factors, Vehicles & Road, Golden hour.

UNIT IV: ROAD SAFETY EQUIPMENTS & SAFETY AUDIT

Anti log Breaking system, Speed Governors, Sheet belt, Helmets, Need for Safety Audit – Concept and Elements of Safety Audit for existing roads – Legal Requirements – Provisions of Motor Vehicle Act and Role of NGO's in Prevention of Accidents.

UNIT V: ACCIDENT STUDIES AND INVESTIGATION

Accident date – Identification of Accident Prone Location – Prioritization – Investigation – Accident Information Report - Problems and Remedies.

OUTCOME:

The students would have gained knowledge on different aspects of road safety audit and its methodology

TEXT BOOKS:

1. Khanna S.K. and Justo C.E.G, "Highway Engineering", Nem Chand and Brothers, Roorkee, 2001
2. Robert F. Baker, "Hand Book of Highway Engineering", Van Nonstrant Keinhold Company, New York, 1975

REFERENCES:

1. Ministry of Surface Transport, "Accident Investigation and Prevention
2. Manual for Highway Engineers in India, Government of India, 2001
3. Robert F.Baker, "The Highway Risk Problem – Policy Issues in Highway Safety", John Wiley and Sons.
4. Subramani, T. “Parking Study On Main Corridors In Major Urban Centre”, International Journal of Modern Engineering Research, Vol.2, No. 3, pp 742-748, 2012.
5. Subramani, T “Assessment Of Potential Impacts On NH7 – 4 Laning From Salem To Karur”, International Journal of Modern Engineering Research, Vol.2, No.3,pp 707-715, 2012.
6. Subramani, T. “Pedestrian Study on Road links in Major Urban Centre”, IOSR Journal of Engineering, Vol.2, No. 4, pp 750-754, 2012.
7. Subramani, T. “Parking Study On Main Corridors In Major Urban Centre”, International Journal of Modern Engineering Research, Vol.2, No. 3, pp 742-748, 2012.
8. Subramani,T, Krishnan.S. And Kumaresan.P.K., Study on Existing Traffic condition in Salem City and Identify the transport facility improvement projects, International Journal of Applied Engineering Research IJAER, Vol.7,No.7, Pp 717 – 726, 2012.
9. Subramani.T, Sivagnanam.M , " Suburban Changes In Salem By Using Remote Sensing Data" , International Journal of Application or Innovation in Engineering & Management (IJAIEM) , Volume 4, Issue 5, May 2015 , pp. 178-187 , ISSN 2319 - 4847. 2015

PAPER IV: ENVIRONMENTAL IMPACT ASSESSMENT OF TRANSPORTATION PROJECTS

OBJECTIVE:

Provides an exposure to various Environmental Laws and importance of EIA on Transportation Projects with respect to noise, air pollution, visual intrusion etc.

UNIT :I ENVIRONMENTAL STANDARDS IN URBAN AREAS AND EIA

Laws concerned with protection of the environment such as Environmental Protection Act, Air and Noise Pollution Act, Motor Vehicle Act, Town and Country Planning Act, Development Control Regulation.

UNIT :II MEASUREMENT AND POLLUTION PREDICTION

Measurement of Air and Noise Pollution, Land Acquisition, Rehabilitation, Collection, Compilation and Presentation of Pollution and Impact Data, Measuring Impact before construction, at the time of construction and after construction

UNIT :III ENVIRONMENTAL QUALITY AND MANAGEMENT

Importance of EIA, Environmental Appraisal, EIA Statement, Vehicle and Traffic Noise, Ambient Noise Level, Heath Effects, Vibration – Damage to building, Exhaust Emission – Pollutant, Health effects, Air Pollution, Urban Ambient Air Quality Standards, Effects on Human being, Vegetation and Animals

UNIT :IV ENVIRONMENTAL MAINTENANCE AND LEGAL SYSTEMS

Impact of Traffic on Environment – Network Pattern, Urban Growth Indicators of Environmental Quality, Energy use, Fuel Economy in Transportation, Energy Efficiency strategies

UNIT :V MITIGATIVE MEASURES AND POLICIES

Mitigative Measures for Air and Noise Pollution Policies and Strategies, Involvement of Stakeholders, Public Participation, Institutional Arrangements.

OUTCOME:

Students would have understood the impact of Transportation projects on the environment and to adopt mitigative measures in the planning stage.

TEXT BOOKS:

1. Larry W Canter, "Environmental Impact Assessment", McGraw Hill Publishers, 1996.

REFERENCES:

1. RaoV.Kolluru; "Environmental Strategies Handbook", McGraw Hill Publishers, 1994.
2. David Banister; "Transport Policy and Environment" E&FN Spain, 1999
3. World Bank; "The Impact of Environmental Assessment – A Review of a World Bank Experience, Washington, 1997.
4. World Bank; Road and the Environment, Washington, 1997.
5. Subramani, T. “Parking Study On Main Corridors In Major Urban Centre”, International Journal of Modern Engineering Research, Vol.2, No. 3, pp 742-748, 2012.
6. Subramani, T “Assessment Of Potential Impacts On NH7 – 4 Laning From Salem To Karur”, International Journal of Modern Engineering Research, Vol.2, No.3,pp 707-715, 2012.
7. Subramani, T. “Pedestrian Study on Road links in Major Urban Centre”, IOSR Journal of Engineering, Vol.2, No. 4, pp 750-754, 2012.
8. Subramani, T. “Parking Study On Main Corridors In Major Urban Centre”, International Journal of Modern Engineering Research, Vol.2, No. 3, pp 742-748, 2012.
9. Subramani, T. “Study of Pollution Prevention Strategies For Reclamation of Ooty Lake”, International Journal of Engineering Research and Applications, Vol.2, Issue.3, pp 783-791, 2012.
10. Subramani,T, Krishnan.S. And Kumaresan.P.K., “Study on Existing Traffic condition in Salem City and Identify the Transport Facility Improvement Projects”, International Journal of Applied Engineering Research IJAER, Vol.7,No.7, Pp 717 – 726, 2012.
11. Subramani.T, Arutselvan.S, Ganesan.S.K , “Analysis Of Highway Air Pollution”, International Journal of Engineering Research and Applications, Volume. 4, Issue. 6 (Version 5), pp 173 - 182, 2014.

PAPER V: TRANSPORT ECONOMICS & MANAGEMENT

OBJECTIVE:

Provides knowledge in economic evaluation and Public private partnership in developing road infrastructure projects and application of systems simulation techniques in modeling transport economic systems.

UNIT I ECONOMIC EVALUATION

Need for Economic Evaluation of Urban Transport Projects – Principles of Economic Analysis – Methods of Economic Evaluation – Comparison of various methods

UNIT II MODELING OF ROAD USER COSTS

Components of Vehicle Operating Cost – Factors affecting Vehicle Operating Cost – Value of Travel Time Saving - Accident Cost

UNIT III TRANSPORT DEMAND SUPPLY CONCEPT

Transport Demand and Supply Concepts - Status of Transport Demand Supply in Metropolitan Cities – Demand and Supply equilibrium - Subsidy in Transport demand – Supply Augmentation and Saturation Consideration

UNIT IV TRANSPORT PRICING

Transport costs – Elasticity of Demand – Average Cost and Marginal Cost Pricing – Market Pricing and Market Segmentation – Second best Pricing – Pricing Policy – Congestion Pricing – Public and Private Transport Pricing – Price Co-ordination

UNIT V FINANCING TRANSPORT SYSTEM

Characteristics of Transportation Infrastructure – Trends in Transportation Infrastructure – Investment Needs, Options and Budgetary Support in Transport Sector – Existing Financing Practices – Principles of Build, Operate and Transfer (BOT) – BOT variants and its applicability– Special Purpose Vehicles-Alternative Financial Resources.

UNIT V: TRAFFIC MANAGEMENT

Cost Effective Management Measures – Traffic Systems Management and Travel Demand Management – Congestion Management, Traffic Calming and Pricing. Area Traffic Management System – Traffic System Management(TSM) with IRC standards- Traffic Regulatory Measures – Travel Demand Management (TDM) - Direct and Indirect Methods - Congestion and Parking Pricing – All Segregation Methods – Coordination among different agencies – Intelligent Transport System for Traffic Management, Enforcement and Education

OUTCOME:

Students would be equipped with the economic principles in dealing with transport supply and demand.

TEXT BOOKS:

1. Robert F Baker, (eds), "Hand Book of Highway Engineering, Van Nostrand Reinhold Company, New York, 1975

REFERENCES:

1. Indian Roads Congress Standards (2002), "Economic Evaluation of Transport Projects", New Delhi.
2. John Khisty C, Kent Lall B, "Transportation Engineering – An Introduction, 3rd Edition, Prentice Hall of India, New Delhi, 2002
3. Hanspeter George; "Cost Benefit Analysis and Public Investment in Transport" – A Survey Butterworths, London, 1973
4. The Institution of Engineers India (1997), "Proceedings of the National Seminar on Infrastructure Development" – Strategies for Transportation Sector, New Delhi.
5. Subramani, T “Assessment Of Potential Impacts On NH7 – 4 Laning From Salem To Karur”, International Journal of Modern Engineering Research, Vol.2, No.3,pp 707-715, 2012.
6. Subramani,T, Krishnan.S. And Kumaresan.P.K., “Study on ExiSting Traffic Condition in Salem City and Identify the Transport Facility Improvement Projects”, International Journal of Applied Engineering Research IJAER, Vol.7,No.7, Pp 717 – 726, 2012.

7. Subramani.T, Arutselvan.S, Ganesan.S.K , “Analysis Of Highway Air Pollution” International Journal of Engineering Research and Applications, Volume. 4, Issue. 6 (Version 5), pp 173 - 182, 201

8. T.Subramani, M.Sivagnanam , " Suburban Changes In Salem By Using Remote Sensing Data" , International Journal of Application or Innovation in Engineering & Management (IJAIEM) , Volume 4, Issue 5, May 2015 , pp. 178-187 , ISSN 2319 - 4847. 2015

9. T.Subramani, M.Sekar , " Preplanning And Scheduling Of Road Construction By Using PPM" , International Journal of Application or Innovation in Engineering & Management (IJAIEM) , Volume 4, Issue 5, pp. 234-244 , 2015