Graduate Diploma in Engineering (Highways)
Brief Course Overview

Code	Course	Course Outline
GEH6.290	**Research Methods**	▪ Information Retrieval Systems; Data Analysis tools and methods; Research Methodologies; Research Proposal. ▪ This is a pre-requisite for *BEH7.390 Engineering Project*, and culminates in the formulation of the research proposal for the *Project.*
GEH6.300	**Pavement Engineering I**	▪ Wearing Surfaces: Types, properties, selection, materials. ▪ Surfacing Design & Construction: Chipseals, AC, Emulsions. Safety. ▪ Pavement Materials, Construction & Quality control. ▪ Sub grade: Preparation, Quality control, Improvement.
GEH7.310	**Transportation Engineering II**	▪ Land Transport Administration, Programmes & Strategies. ▪ Revenue Sources, Funding, Allocation procedures, Legislation. ▪ Project Evaluation: Specific, Simplified, Full Procedures, Accident Analysis, Risk Analysis, Project Feasibility Report, Scheme Assessments. ▪ Quality Management: Concepts, Systems, Quality Plans. ▪ Asset and Maintenance Management: Lifecycle Asset Management, Contract types, Asset & Maintenance Management systems, Optimised Decision Making, Risk assessment, Maintenance Management.
GEH7.320	**Project Management**	▪ Project Management: Principles & Functions. ▪ Cost, Time & Risk Management. ▪ Contract Management: Conditions of Contract, Costing, Tendering, Pricing Procedures, Variations, Time Extensions, Disputes.
GEH7.330	**Engineering Management**	▪ Leadership; Operations Management; Planning & Control; Decision-making; Marketing; Employment Relations; Human Resource Management; Change Management; Establishing a Business; Office Functions.
GEH7.340	**Geometric Design**	▪ Geometric Design Criteria; Horizontal & Vertical Alignment Design; Aesthetics; Safety; Roadside features; CAD applications.
GEH7.350	**Drainage Design**	▪ Road Drainage Components & Hydraulics; Surface Drainage; Urban Storm-water Drainage Systems; Subsurface Drainage Systems; Culvert Design; External Loadings on Pipes; Environmental Impact Assessment & Management.
GEH7.360	**Pavement Engineering II**	▪ Pavement Design: Fundamentals; Material Properties & Characterisation; Design Traffic Determination; Mechanistic Analysis; Rigid Pavements; Pavement Rehabilitation Design; Computer Applications.
GEH7.370	**Traffic Engineering**	▪ Traffic Surveys; Traffic Flow Theory; Capacity Analysis; Intersection Design; Parking; Traffic & Transportation Planning; Road Crash Investigations.
GEH7.380	**Engineering Economics**	▪ Accounting: Principles; Financial Statements; Costing & Budgeting. ▪ Economics: Concepts; Principles; Resources; Supply & Demand; GDP.
GEH7.390	**Engineering Project**	▪ Project that requires the application of cumulative technical knowledge and skills from taught courses and principles underpinning highway engineering. The project will reflect an ability to: ▪ Identify and analyse a highway engineering issue/problem. ▪ Apply research methodology, data collection & analysis and problem-solving skills. ▪ Draw valid conclusions and formulate recommendations, and ▪ Report findings in an appropriate format. ▪ *BEH6.290 Research Methods* is a pre-requisite for this course.
GEH7.399	**Engineering Project A**	▪ This course aims to integrate and synthesise previously acquired knowledge and skills in a typical project in which the student is required to investigate an engineering problem or project or situation; propose and develop a suitable solution, design or response; and communicate the execution and results using appropriate means. Research Methods is not a pre-requisite since the emphasis is on practical application of acquired knowledge rather than on fundamental research.