CLASS	DESCRIPTION
Domain 1	**Fundamentals**
Task	Describe crash frequencies, crash rates, predicted crashes, expected crashes, and excess crashes.
Knowledge	Crash frequencies, crash rates, predicted crashes, expected crashes, and excess crashes
Knowledge	Statistics (e.g., measures of central tendency and dispersion, z tests, t tests, ANOVA, simple regression)
Knowledge	Research methods
Knowledge	Crash data
Skill	Differentiating among different crash values
Skill	Estimating accuracy of the crash values
Skill	Data preparation and analysis
Task	Identify limitations (or pitfalls) of crash rates as a measure of safety.
Knowledge	Differences between crash rate and expected crash frequency
Knowledge	What crash rate represents (i.e., the safety of a user)
Knowledge	Crash frequencies, crash rates, predicted crashes, and expected crashes
Knowledge	Crash data
Knowledge	Exposure data
Skill	Differentiating among different crash values
Skill	Data preparation and analysis
Task	Apply the use of predicted crashes, expected crashes, and excess crashes.
Knowledge	Crash frequencies, crash rates, predicted crashes, expected crashes, and excess crashes
Knowledge	Statistics (e.g., measures of central tendency and dispersion, z tests, t tests, ANOVA, simple regression)
Knowledge	Crash data
Knowledge	Exposure data
Knowledge	Road safety management process
Skill	Applying different safety performance measures to given processes (e.g., network screening, evaluation)
Skill	Differentiating among different safety performance measures
Skill	Estimating accuracy of the safety performance measures (e.g., crash modification factor standard errors)
Skill	Evaluating site conditions to determine the appropriate safety performance measure
Skill	Data preparation and analysis
Task	Define risk and its uses.
Knowledge	Statistics (e.g., measures of central tendency and dispersion, z tests, t tests, ANOVA, simple regression)
Knowledge	Motor vehicle characteristics
Knowledge	Road user characteristics
Knowledge	Crash frequencies, crash rates, predicted crashes, and expected crashes
Knowledge	Measures of exposure

Knowledge	Situations in which risk should be considered
Skill	Interpreting statistical analysis
Skill	Data preparation and analysis
Task	Differentiate between road safety (predicted and expected crash frequencies) and risk.
Knowledge	Statistics (e.g., measures of central tendency and dispersion, z tests, t tests, ANOVA, simple regression)
Knowledge	Definition of road safety
Knowledge	Definition of risk
Knowledge	Safety performance functions
Skill	Interpreting statistical analysis
Skill	Data preparation and analysis
Task	Describe crash injury severity scales and levels.
Knowledge	Crash injury severity scales and levels
Knowledge	Sources of data (e.g., police reports, medical)
Knowledge	Differences between crash injury severity level and person injury severity
Skill	Managing crash data from different sources
Skill	Incorporating medical injury data into crash analysis
Task	Describe what makes crashes reportable.
Knowledge	Crash frequencies, crash rates, predicted crashes, and expected crashes
Knowledge	Property damage-only and minimum injury reporting limits and changes therein
Knowledge	Definition of a fatality
Knowledge	Definition of injury by police
Knowledge	Definitions of motor vehicle crash reporting
Knowledge	Road user vulnerability and frailty
Skill	Preparing and analyzing data
Skill	Searching for data sources
Task	Discuss the strengths and limitations of crash reporting (e.g., how reportability criteria affect the count of crashes, proportion of reportable crashes that are reported).
Knowledge	How reportability criteria affect the count of crashes
Knowledge	Proportion of reportable crashes that are reported
Knowledge	Statistics (e.g., measures of central tendency and dispersion, z tests, t tests, ANOVA, simple regression)
Knowledge	Crash registries (data sources) and their linkages
Knowledge	Road user vulnerability and frailty
Knowledge	Variables that affect crash reporting
Knowledge	Process of reporting to police and hospital
Knowledge	Insurance requirements

Skill	Performing statistical analysis
Skill	Preparing and analyzing data
Task	Describe the physics (e.g., relationship of speed and impact forces) of a crash.
Knowledge	Elementary physics (e.g., momentum and mass, change in velocity, relationship to injury probability)
Knowledge	Motor vehicle characteristics (e.g., crashworthiness)
Knowledge	Road user characteristics (e.g., frailty, age, gender, seating position in vehicle, seat belt wearing)
Knowledge	Crash types and associated impact results
Knowledge	Vehicle testing and anthropometric crash test dummies
Skill	Performing data preparation and analysis
Skill	Calculating and assessing the resulting impacts of crash forces (e.g., change in velocity and probability of injury severity and death)
Task	Discuss how speed affects crash frequency and severity.
Knowledge	Road safety research findings on crash frequency and speed
Knowledge	Road safety research findings on crash severity and speed
Knowledge	How speed is or is not estimated and recorded in a crash report
Knowledge	Statistics (e.g., measures of central tendency and dispersion, z tests, t tests, ANOVA, simple regression)
Knowledge	Research methods
Knowledge	Motor vehicle characteristics
Knowledge	Road user characteristics
Knowledge	Crash frequencies, crash rates, predicted crashes, and expected crashes
Knowledge	Road user vulnerability and frailty
Knowledge	Human factors (e.g., reaction time)
Skill	Synthesizing literature
Skill	Preparing and analyzing data
Skill	Performing statistical analysis
Skill	Assessing the validity and relevance of the research findings
Task	Describe the safety effects of posted speed as it relates to operating speed.
Knowledge	Road safety research findings on posted speed as it relates to operating speed
Knowledge	Statistics (e.g., measures of central tendency and dispersion, z tests, t tests, ANOVA, simple regression)
Knowledge	Research methods
Knowledge	Motor vehicle characteristics
Knowledge	Road user characteristics
Knowledge	Crash frequencies, crash rates, predicted crashes, and expected crashes
Knowledge	Propensity for road user adaptation
Skill	Performing statistical analysis

Skill	Data preparation and analysis
Skill	Assessing the validity of the research findings
Task	Describe how human limitations in information processing lead to a reliance on expectations in driving and the consequences of roadway design violating driver expectations.
Knowledge	Human factors principles
Knowledge	Driver limitations
Knowledge	Geometric design
Knowledge	Traffic operations
Skill	Linking human limitations to geometric elements and traffic control devices
Skill	Linking human expectations to geometric elements and traffic control devices
Task	Describe the positive guidance approach to roadway design.
Knowledge	Human information processing
Knowledge	Mental workload and relationship to safety
Knowledge	Relationship between information processing and driver expectation
Skill	Identifying information overload and correcting deficiencies
Skill	Identifying driver expectations and the impact of violating those expectancies
Task	Describe human factors issues contributing to different crash types.
Knowledge	Crash types (e.g., run off road, intersection)
Knowledge	Effects of driver visual search
Knowledge	Perception of closing velocity
Skill	Diagnosis of crash contributing factors
Task	Describe how the difference between nominal and substantive safety affects liability, risk management, rights of road users for safety, and demands on the professional.
Knowledge	Geometric design
Knowledge	Traffic operations/engineering
Knowledge	Nominal and substantive safety and the differences between the two
Knowledge	How liability is affected by adherence to standards, design exceptions, and flexibility in design
Knowledge	How road safety is affected by adherence to standards versus evidence-based design
Knowledge	How design and operational decisions affect road user safety
Skill	Estimating safety impacts of geometric and operation decisions
Skill	Determining the differences between meeting nominal and substantive safety
Task	Describe how crash costs are estimated and the strengths and weaknesses of these estimates.
Knowledge	Human capital cost approaches
Knowledge	Willingness-to-pay approaches
Knowledge	Road safety research findings

Knowledge	Cost sources
Knowledge	Statistics (e.g., measures of central tendency and dispersion, z tests, t tests, ANOVA, simple regression)
Knowledge	Research methods
Knowledge	Crash types
Knowledge	Crash injury severity levels
Knowledge	Basic economics
Skill	Synthesizing information
Skill	Preparing and analyzing data
Skill	Assessing the validity and relevance of the research findings
Task	Describe the elements of economic analysis in policy and project development, their applicability, and their strengths and weaknesses.
Knowledge	Crash costs
Knowledge	How each element affects economic analysis results (e.g., service life, discount rate)
Knowledge	Basic economics
Knowledge	Cost effectiveness
Knowledge	Cost-benefit analysis
Knowledge	Road safety research findings
Knowledge	Statistics (e.g., measures of central tendency and dispersion, z tests, t tests, ANOVA, simple regression)
Knowledge	Crash frequencies, crash rates, predicted crashes, and expected crashes
Knowledge	Policy and project development
Skill	Performing economic analysis
Skill	Preparing and analyzing data
Skill	Synthesizing information
Domain 2	**Road Safety Management**
Task	Describe steps, strengths, and weaknesses in the roadway safety management process for spot-safety analyses.
Knowledge	Road safety management process
Knowledge	Spot safety analysis and treatments
Knowledge	Diagnostic methods
Knowledge	Countermeasures and target crash types
Skill	Conducting spot safety analysis
Task	Describe steps, strengths, and weaknesses in the roadway safety management process for systemic analyses.
Knowledge	Road safety management process
Knowledge	Systemic analysis and treatments
Knowledge	The difference between systematic and systemic analysis
Skill	Conducting systemic analysis

Task	List steps, strengths, and weaknesses of the various network screening processes.
Knowledge	Network screening processes and their strengths and weaknesses
Knowledge	Performance measures
Knowledge	Crash frequencies, crash rates, predicted crashes, expected crashes, and excess crashes
Knowledge	How crashes occur and their related injury severity
Knowledge	Roadway network attributes and traffic volumes
Knowledge	Data requirements for network screening
Skill	Processing and managing data
Skill	Applying various network screening methods
Skill	Applying safety performance functions for network screening
Skill	Using historic crash data for network screening when safety performance functions are not available
Task	Apply the results of network screening to select locations with potential for crash reduction.
Knowledge	Criteria for prioritizing sites for diagnosis
Knowledge	Performance measures
Knowledge	Crash frequencies, crash rates, predicted crashes, expected crashes, and excess crashes
Skill	Using safety performance functions
Skill	Assembling crash, traffic, and roadway inventory data
Skill	Applying statistics (e.g., measures of central tendency and dispersion, z tests, t tests, ANOVA, simple regression)
Skill	Integrating results of screening based on various performance measures
Task	Describe the strengths and weaknesses of methods for diagnosing safety performance.
Knowledge	Crash report forms
Knowledge	Human factors principles
Knowledge	Methods for diagnosing safety performance
Knowledge	Performance measures
Knowledge	Crash frequencies, crash rates, predicted crashes, expected crashes, and excess crashes
Skill	Analyzing, tabulating, and diagraming crashes
Skill	Extracting contributing factors from crash records
Task	Diagnose safety performance of site characteristics at a selected location through road safety audit or inspection.
Knowledge	Human factors and driving behavior
Knowledge	Anecdotal information about site-specific travel patterns and multimodal users
Knowledge	Crash types
Knowledge	Injury severity levels
Knowledge	Geometric design and operational controls
Knowledge	Road safety audits and road safety inspections
Skill	Linking contributing factors with site characteristics

Skill	Collaborating with interagency partners and other relevant agencies
Skill	Conducting field investigations
Skill	Conducting road safety audits
Skill	Conducting road safety inspections
Task	Identify potential treatments to address the contributing factors resulting from diagnosis.
Knowledge	Information resources for potential countermeasures (e.g., Crash Modification Factor Clearinghouse, Highway Safety Manual, Transportation Research Information Services)
Knowledge	Safety research findings on effectiveness of countermeasures
Knowledge	Contributing factors for target crash types and severity
Skill	Synthesizing information
Skill	Selecting appropriate countermeasures
Skill	Assessing the validity and relevance of the research findings
Task	Conduct an economic appraisal to prioritize safety treatments from a location-specific perspective.
Knowledge	Engineering economics (e.g., service life, discount rate, treatment cost, statistical value of a life, crash costs)
Knowledge	Available crash cost values
Skill	Using various methods to conduct economic appraisal
Skill	Prioritizing projects based on economic appraisal results
Task	Conduct an economic appraisal to prioritize safety treatments from a systemic perspective.
Knowledge	Engineering economics (e.g., service life, discount rate, treatment cost, statistical value of a life, crash costs)
Knowledge	Available crash cost values
Knowledge	The systemic approach to safety
Skill	Using various methods to conduct economic appraisal
Skill	Prioritizing projects based on economic appraisal results
Task	Rank prioritized safety projects using different methods.
Knowledge	Prioritization and ranking methods
Knowledge	Agency priorities as they relate to safety projects
Skill	Prioritizing projects based on economic appraisal results
Task	Demonstrate how to integrate safety considerations into projects (e.g., resurfacing, reconstruction, rehabilitation, maintenance, capacity).
Knowledge	Different types of infrastructure projects (e.g., resurfacing, reconstruction, rehabilitation, maintenance, capacity)
Knowledge	How various project types and project elements relate to each other
Knowledge	Applicable safety considerations
Knowledge	Safety effects of project elements
Skill	Collaboration between business units within a transportation agency
Task	Describe the pitfalls of single project evaluation.

Knowledge	The process of single project evaluation
Knowledge	Biases and variables that can affect evaluation results
Knowledge	Evaluation methods
Skill	Conducting single versus multiple project evaluation
Skill	Interpreting evaluation results
Skill	Estimating how safety is affected by other project elements
Task	Discuss the strengths and weaknesses of the methods used to evaluate the safety effect of treatments (e.g., empirical Bayes before-and-after, before-and-after with comparison group, cross-sectional).
Knowledge	Evaluation methods
Knowledge	Biases and variables that can affect evaluation results
Knowledge	Required data for evaluation
Knowledge	Comparative statistics
Skill	Statistical analysis
Skill	Interpreting evaluation results
Domain 3	**Acquiring and Using Safety Data**
Task	Describe relevant data and their respective sources (e.g., crash, user, traffic volume/exposure, roadway inventory).
Knowledge	Required and available data
Knowledge	Data sources, elements, and limitations
Skill	Identifying relevant data sources
Skill	Evaluating the quality of safety data
Skill	Developing and implementing a data collection plan
Task	Discuss data needs for the roadway safety management process (e.g., network screening, project prioritization).
Knowledge	The roadway safety management process
Knowledge	Required and available data for different processes
Knowledge	Data sources, elements, and limitations
Skill	Identifying relevant data sources
Skill	Preparing data for different processes
Task	Describe why safety data should be linked with other databases (e.g., roadway, traffic volume).
Knowledge	Data sources, elements, and limitations
Knowledge	Network screening methods and diagnosis
Knowledge	Safety performance functions
Skill	Identifying data elements required to estimate safety performance
Task	Analyze crash datasets to determine relationships between crash patterns and other characteristics (e.g., roadway features, users, behaviors) to establish strategic emphasis areas.
Knowledge	Data sources, elements, and limitations

Knowledge	Crash patterns
Knowledge	Potential emphasis areas and strategies
Skill	Database management
Skill	Extracting crash data elements and determining relationships
Task	Describe crash data processing, from initial reporting to final coding.
Knowledge	Police officer crash reporting
Knowledge	Quality control/quality assurance procedures
Knowledge	Crash location referencing
Knowledge	Data management
Skill	Evaluating accessibility, accuracy, completeness, timeliness, integration, and uniformity of the information related to crash data
Task	Identify the key characteristics of different crash types (e.g., rear end, sideswipe).
Knowledge	Crash types and associated factors
Knowledge	Road user, vehicle, roadway, and environmental characteristics
Knowledge	Road safety research findings
Skill	Interpreting crash report information
Skill	Synthesizing and assessing relevant literature
Task	Identify the level of detail needed from the crash reports for the various steps of the safety management process (e.g., diagnostics, countermeasure selection, network screening).
Knowledge	The safety management process
Knowledge	Available crash report data
Knowledge	Data sources, elements, and limitations
Skill	Acquiring and assembling crash data
Task	Describe the constraints and challenges of using safety data (e.g., crash, traffic volumes, roadway inventory, hospital data) associated with completeness, timeliness, accuracy, and uniformity.
Knowledge	Safety data collection and availability for analysis
Knowledge	Potential constraints and challenges related to safety data
Skill	Assessing data quality
Task	Illustrate potential errors in safety data analysis and interpretation.
Knowledge	Potential errors for various safety analysis methods
Knowledge	Acceptable level of error
Skill	Statistics (e.g., measures of central tendency and dispersion, z tests, t tests, ANOVA, simple regression)
Skill	Interpreting analysis results
Skill	Assessing anticipated versus unexpected results
Domain 4	**Crash Prediction and Trend Interpretation**

Task	Discuss the random nature of crashes and how regression to the mean influences interpretations of data trends.
Knowledge	Statistics (e.g., measures of central tendency and dispersion, z tests, t tests, ANOVA, simple regression)
Knowledge	Regression to the mean
Knowledge	Safety research findings on crash trends
Knowledge	The spatial and temporal nature of crashes
Skill	Crash data trends analysis
Skill	Interpreting data trends
Task	Identify different statistical methods used to analyze safety data (e.g., crash data, roadway data, exposure data).
Knowledge	Statistical methods
Knowledge	Safety data characteristics
Knowledge	Trend analysis
Skill	Applying statistical methods
Skill	Interpreting findings
Task	Explain the attributes of different statistical methods (e.g., empirical Bayes, logistics regression) including common applications and errors related to safety data analysis.
Knowledge	Statistical methods
Knowledge	Safety data characteristics
Knowledge	Errors and pitfalls of data analysis and interpretation including common applications
Skill	Recognizing the appropriate use of statistical methods
Task	Explain how and why safety trends change over time.
Knowledge	Causal factors related to crash trends
Knowledge	Time series analysis
Knowledge	Nature of crash data
Knowledge	Sources of crash data
Skill	Trend analysis
Skill	Assessing external influences
Skill	Statistics (e.g., measures of central tendency and dispersion, z tests, t tests, ANOVA, simple regression)
Task	Identify how and where to consider potential points of treatment/countermeasure.
Knowledge	Available treatments / countermeasures and their potential applications
Knowledge	Network screening methods
Knowledge	Systemic approach
Skill	Using network screening
Skill	Using systemic analysis
Skill	Selecting appropriate treatments / countermeasures
Skill	Predicting crash frequency

Task	Explain the process of developing safety performance functions (SPFs) including how to select and calibrate SPFs.
Knowledge	Purpose of SPFs
Knowledge	Data requirements and limitations (e.g., sample size, data elements)
Knowledge	Development and application of calibration factors
Knowledge	Statistical modeling
Knowledge	How data is categorized for SPF development (e.g., by facility type)
Skill	Assessing calibration of SPFs
Skill	Interpreting statistical models
Task	Explain how and when to use predicted versus expected crash frequency.
Knowledge	The nature and historical availability of crash data
Knowledge	Requirements for using expected crash frequency
Knowledge	The application of models developed using the empirical Bayes method
Knowledge	Predicted and expected crash frequency definitions and applications
Knowledge	Roadway inventory data and site conditions
Skill	Interpreting the order of magnitude of a roadway change (i.e., what constitutes a significant change to the roadway)
Skill	Estimating crashes for new and existing sites
Domain 5	**Target Crashes and Countermeasures**
Task	Identify different sources of countermeasures (e.g., online resources, engineering studies, design guides).
Knowledge	Available resources
Skill	Determining relevance of applicable information
Task	Describe the different types and characteristics of available evidence-based countermeasures (e.g., engineering, behavioral, policy initiatives, enforcement, public health, EMS, education/public outreach efforts).
Knowledge	Available evidence-based countermeasures
Knowledge	Road safety research findings related to a countermeasure by the various disciplines
Skill	Assessing the validity and relevance of the research findings
Skill	Synthesizing information
Task	Explain the importance and purpose of selecting a particular target crash type and severity for treatment.
Knowledge	Crash and severity types
Knowledge	Countermeasures / treatments and their appropriate application
Skill	Associating treatments with target crash types
Task	Describe the data requirements for evaluating the effectiveness of a countermeasure.
Knowledge	Countermeasure safety effectiveness
Knowledge	Required data for different evaluation methods
Skill	Conducting evaluations

Skill	Applying appropriate statistical methods for countermeasure assessment
Skill	Accounting for potential biases
Task	Assess the safety effectiveness of a particular countermeasure based on prior research.
Knowledge	Countermeasure safety effectiveness
Knowledge	Available prior research
Skill	Assessing the validity and relevance of the research findings
Skill	Conducting evaluations
Skill	Understanding appropriate statistical methods for countermeasure assessment
Task	Identify the process for applying a crash modification factor (CMF) and the expected change in crash frequency or severity.
Knowledge	CMF and site base conditions of applicable SPFs
Knowledge	The applicability of a given CMF to site conditions
Skill	Using the standard error to develop a range of outcomes
Task	Select an appropriate countermeasure and crash modification factor (CMF) based on local/site conditions.
Knowledge	CMF and site base conditions of applicable SPFs
Knowledge	The applicability of a given CMF to site conditions
Knowledge	Understanding transferability issues
Skill	Determining the appropriateness of the CMF for the site conditions
Skill	Collecting site condition information
Task	Discuss the considerations, other than safety effectiveness, that influence the selection of a countermeasure (e.g., cost, modal split, public acceptance).
Knowledge	Factors such as cost, modal split, and public acceptance
Knowledge	Considering unintended consequences
Skill	Distinguishing qualitative from quantitative data and balancing the different factors and safety
Task	Describe the factors to consider when calculating the effectiveness of applying multiple treatments at the same location.
Knowledge	The treatment characteristics and their relationship with target crash/es)
Knowledge	Independence of the treatments
Skill	Identifying a relevant crash modification factor for each treatment
Task	Describe the issues associated with selecting and/or developing a crash modification factor (CMF) in terms of data requirements, evaluation method, quality, accuracy, and confounding factors.
Knowledge	Road safety research findings
Knowledge	Required data for different evaluation methods
Knowledge	Issues related to the development of CMFs (e.g., potential biases, sample size, study design)
Knowledge	CMF quality criteria

Skill	Synthesizing relevant literature and assessing the validity and relevance of the research findings
Skill	Applying appropriate statistical methods for countermeasure assessment
Skill	Accounting for potential biases
Domain 6	**Multimodal Transportation Safety**
Task	Describe the safety effects of operating speed on drivers, bicyclists, motorcyclists, and pedestrians, as well as younger and older road users.
Knowledge	Road safety research findings on operating speeds
Knowledge	Statistics (e.g., measures of central tendency and dispersion, z tests, t tests, ANOVA, simple regression)
Knowledge	Research methods
Knowledge	Motor vehicle characteristics
Knowledge	Road user characteristics
Knowledge	Crash frequencies, crash rates, predicted crashes, and expected crashes
Knowledge	Road user vulnerability and frailty
Skill	Performing statistical analysis
Skill	Data preparation and analysis
Skill	Assessing the validity of the research findings
Task	Define speed management strategies (e.g., design, operational) that affect the safety of all road users.
Knowledge	Road safety research findings on speed management strategies
Knowledge	Statistics (e.g., measures of central tendency and dispersion, z tests, t tests, ANOVA, simple regression)
Knowledge	Motor vehicle characteristics
Knowledge	Road user characteristics
Knowledge	Research methods
Knowledge	Crash frequencies, crash rates, predicted crashes, and expected crashes
Knowledge	Road user vulnerability and frailty
Skill	Performing statistical analysis
Skill	Data preparation and analysis
Skill	Assessing the validity of the research findings
Skill	Selecting speed management strategies that provide the safety performance envisioned for the intended road users
Task	Explain the relationship between design parameters (e.g., sight distance, turning radius, cross section) and their safety effects on all road users.
Knowledge	Road safety research findings on design parameters
Knowledge	Statistics (e.g., measures of central tendency and dispersion, z tests, t tests, ANOVA, simple regression)
Knowledge	Geometric design
Knowledge	Motor vehicle characteristics

Knowledge	Road user characteristics
Knowledge	Research methods
Knowledge	Crash frequencies, crash rates, predicted crashes, and expected crashes
Skill	Performing statistical analysis
Skill	Data preparation and analysis
Skill	Assessing the validity of the research findings
Task	Explain the relationship between operational parameters (e.g., signal cycle, walking speeds, traffic control devices) and their safety effects on all road users (all ages and abilities) and motor vehicle types (e.g., commercial vehicles, public transit, school buses, recreational vehicles).
Knowledge	Road safety research findings on operational parameters
Knowledge	Statistics (e.g., measures of central tendency and dispersion, z tests, t tests, ANOVA, simple regression)
Knowledge	Geometric design
Knowledge	Traffic operations and control devices
Knowledge	Motor vehicle characteristics
Knowledge	Road user characteristics
Knowledge	Research methods
Knowledge	Crash frequencies, crash rates, predicted crashes, and expected crashes
Skill	Performing statistical analysis
Skill	Data preparation and analysis
Skill	Assessing the validity of the research findings
Task	Discuss the contributing factors of crashes between motor vehicles and pedestrians and related treatments.
Knowledge	Road safety research on crash causation
Knowledge	Statistics (e.g., measures of central tendency and dispersion, z tests, t tests, ANOVA, simple regression)
Knowledge	Geometric design
Knowledge	Traffic operations and control devices
Knowledge	Motor vehicle characteristics
Knowledge	Road user characteristics
Knowledge	Research methods
Knowledge	Crash frequencies, crash rates, predicted crashes, and expected crashes
Knowledge	Treatments and their safety effects
Knowledge	Human factors
Skill	Safety diagnosis
Skill	Selection of countermeasures
Skill	Linking crash attributes to geometric elements and traffic control devices
Skill	Performing statistical analysis

Skill	Data preparation and analysis
Skill	Assessing the validity of the research findings
Task	List the contributing factors of crashes between motor vehicles and bicyclists and related treatments.
Knowledge	Road safety research on crash causation
Knowledge	Statistics (e.g., measures of central tendency and dispersion, z tests, t tests, ANOVA, simple regression)
Knowledge	Geometric design
Knowledge	Traffic operations and control devices
Knowledge	Motor vehicle characteristics
Knowledge	Road user characteristics
Knowledge	Research methods
Knowledge	Crash frequencies, crash rates, predicted crashes, and expected crashes
Knowledge	Treatments and their safety effects
Knowledge	Human factors
Skill	Safety diagnosis
Skill	Selection of countermeasures
Skill	Linking crash attributes to geometric elements and traffic control devices
Skill	Performing statistical analysis
Skill	Data preparation and analysis
Skill	Assessing the validity of the research findings
Task	List the contributing factors of crashes between pedestrians and bicyclists and related treatments.
Knowledge	Road safety research on crash causation
Knowledge	Statistics (e.g., measures of central tendency and dispersion, z tests, t tests, ANOVA, simple regression)
Knowledge	Geometric design
Knowledge	Traffic operations and control devices
Knowledge	Motor vehicle characteristics
Knowledge	Road user characteristics
Knowledge	Research methods
Knowledge	Crash frequencies, crash rates, predicted crashes, and expected crashes
Knowledge	Treatments and their safety effects
Knowledge	Human factors
Skill	Safety diagnosis
Skill	Selection of countermeasures
Skill	Linking crash attributes to geometric elements and traffic control devices
Skill	Performing statistical analysis
Skill	Data preparation and analysis

Skill	Assessing the validity of the research findings
Task	Identify mobility and safety tradeoffs of a multimodal system (e.g., complete streets).
Knowledge	Multi-attribute decision analysis
Knowledge	Economic analysis
Knowledge	Traffic operations and control devices
Knowledge	Relevant crash modification factors (CMFs)
Knowledge	Traffic (e.g., capacity, delay) analysis
Knowledge	Research methods
Knowledge	Crash frequencies, crash rates, predicted crashes, and expected crashes
Skill	Performing economic analysis
Skill	Data preparation and analysis
Skill	Assessing the validity of the research findings
Task	Explain the role of human factors and behavioral adaptation as they relate to the safety of multimodal facilities.
Knowledge	Human factors
Knowledge	Behavioral adaptation
Knowledge	Multimodal facility types
Knowledge	Road safety research on crash causation
Skill	Human factors analysis in multimodal facilities
Domain 7	**Addressing Safety Problems with Policy**
Task	Identify national transportation safety policy initiatives that have been implemented in Gulf countries.
Knowledge	History and evolution of safety management approaches
Skill	Synthesizing relevant literature
Task	Explain how policies and standards affect the safety of road users.
Knowledge	Road safety research evaluation of policies
Knowledge	Statistics (e.g., measures of central tendency and dispersion, z tests, t tests, ANOVA, simple regression)
Knowledge	Geometric design
Knowledge	Traffic operations and control devices
Knowledge	Motor vehicle characteristics
Knowledge	Road user characteristics
Knowledge	Crash frequencies, crash rates, predicted crashes, and expected crashes
Skill	Reviewing policies and standards
Skill	Assessing the validity of the research findings
Skill	Spotting opportunities for user adaptation and safety consequences
Skill	Linking policies' impacts (e.g., intended or unintended) and safety outcomes
Task	Describe the process by which an identified safety problem and research findings lead to formulation of policy.

Knowledge	History of policy development
Knowledge	Development of policy
Knowledge	Organizational behavior
Knowledge	Policy adoption requirements
Knowledge	Elementary public knowledge process
Skill	Reviewing policies
Skill	Human relations
Task	Develop policies that support the implementation of countermeasures to address target crash types.
Knowledge	History of policy development
Knowledge	Development of policy
Knowledge	Policy adoption requirements
Knowledge	Road safety research evaluation of policies
Knowledge	Statistics (e.g., measures of central tendency and dispersion, z tests, t tests, ANOVA, simple regression)
Knowledge	Geometric design
Knowledge	Traffic operations and control devices
Knowledge	Motor vehicle characteristics
Knowledge	Road user characteristics
Knowledge	Crash frequencies, crash rates, predicted crashes, and expected crashes
Knowledge	Relevant countermeasures to selected target crashes
Skill	Reviewing policies
Skill	Assessing the validity of the research findings
Skill	Developing policy
Skill	Predicting safety consequences
Skill	Predicting non-safety consequences
Skill	Cost-benefit analysis
Task	Identify the different monetary, mobility, and social effects associated with the implementation of road safety policies.
Knowledge	Economic analysis
Knowledge	Cost implications
Knowledge	Community impacts (e.g., air pollution, modal split)
Knowledge	Road safety research evaluation of policies
Knowledge	Statistics (e.g., measures of central tendency and dispersion, z tests, t tests, ANOVA, simple regression)
Knowledge	Geometric design
Knowledge	Traffic operations and control devices
Knowledge	Traffic analysis (e.g., capacity, delay)

Knowledge	Crash frequencies, crash rates, predicted crashes, and expected crashes
Skill	Reviewing policies
Skill	Assessing the validity of the research findings
Skill	Developing policy
Skill	Predicting safety consequences
Skill	Predicting non-safety consequences
Skill	Cost-benefit analysis
Task	Describe policy efforts that have improved road safety outside Gulf countries (e.g., automated speed enforcement in France, vision zero in Sweden).
Knowledge	International sources of information
Knowledge	International road safety initiatives
Knowledge	International road safety organizations (e.g., Permanent International Association of Road Congresses, Stichting Wetenschappelijk Onderzoek Verkeersveiligheid (SWOV))
Skill	Reviewing policies
Skill	Assessing the validity of the research findings
Skill	Predicting safety consequences
Task	Describe how policy affects the funding for transportation safety projects (e.g., vision zero adopted by a local agency will require additional funds).
Knowledge	Policy development
Knowledge	Finance and budget strategies
Skill	Cost analysis
Skill	Budgeting
Skill	Reviewing policies
Task	Describe the relationship between policy and behavioral change (e.g., red-light cameras).
Knowledge	Road safety research evaluation of policies
Knowledge	Traffic operations and control devices
Knowledge	Road user characteristics
Knowledge	Human factors - adaptation
Skill	Reviewing policies
Skill	Assessing the behavioral impact of policies
Domain 8	**Safe System and Vision Zero Approaches**
Task	Identify and explain the role of the responsible parties (e.g., providers of infrastructure, vehicle manufacturers, road users) in Safe System and Vision Zero approaches.
Knowledge	Safe System approach
Knowledge	Vision Zero approach

Knowledge	History and motivation for developing the two approaches
Skill	Synthesize international practices
Skill	Adapting ideas to local environment, legislation, and practice
Task	List the key principles and strategies of Safe System and Vision Zero approaches.
Knowledge	Safe System approach
Knowledge	Vision Zero approach
Knowledge	History and motivation for developing the two approaches
Skill	Synthesize international practices
Task	Explain how the Safe System and Vision Zero approaches affect the role of engineers, behavioral safety professionals, and planners.
Knowledge	Safe System approach
Knowledge	Vision Zero approach
Knowledge	History and motivation for developing the two approaches
Knowledge	General responsibilities and roles of professions
Skill	Comparing the two approaches with current practice
Task	Identify key steps and challenges to implement Safe System and Vision Zero approaches.
Knowledge	Safe System approach
Knowledge	Vision Zero approach
Knowledge	History and motivation for developing the two approaches
Knowledge	State of the practice of implementing agencies
Knowledge	Challenges (e.g., changing engineering practice, funding, community support)
Skill	Integrating the two approaches into agency practice
Skill	Gaining agency and community support
Task	Describe the development of a strategic road safety plan within the Safe System and Vision Zero approaches.
Knowledge	Safe System and Vision Zero approaches and principal strategies
Knowledge	History and motivation for developing the two approaches
Knowledge	Strategic plan development
Knowledge	Benchmarks (e.g., goals and objectives) in typical strategic plans
Knowledge	Expected time frames, outcomes and feasibility of strategies and actions
Knowledge	Partners in safety planning
Skill	Building partnerships and consensus
Skill	Developing strategic plans