

ENGR 2034 GEOMETRIC DESIGN OF ROADS (WSTC ASSOCD)

Credit Points 10

Coordinator Abbas Ranjbar ([https://directory.westernsydney.edu.au/search/name/Abbas Ranjbar/](https://directory.westernsydney.edu.au/search/name/Abbas%20Ranjbar/))

Description This is an introductory subject covering the design of dimensions and configurations of the visible features of a roadway. It will provide students with an understanding of pavement widths, horizontal and vertical alignment, slopes channelization, intersections and other features that can significantly affect the operations, safety, and capacity of the roadway network. This subject is designed in collaboration with Transport for NSW.

School Eng, Design & Built Env

Discipline Transport Engineering

Student Contribution Band HECS Band 2 10cp

Check your fees via the Fees (https://www.westernsydney.edu.au/currentstudents/current_students/fees/) page.

Level Undergraduate Level 2 subject

Pre-requisite(s) MATH1010 Fundamentals for Engineering Studies

Restrictions

Students must be enrolled at The College in 7022 Associate Degree in Engineering

Learning Outcomes

1. Explain highway terminology and concepts of geometric design of roads.
2. Evaluate the various social, technical and environmental aspects involved with road geometry design.
3. Analyse the factors influencing geometric roads design and link these to safety.
4. Perform basic calculations related to road geometry design and traffic flow.
5. Explain the methods of design including horizontal and vertical alignment design and design of cross-sections as well as earthwork volume calculations.

Subject Content

1. Introduction
2. Fundamental Considerations
3. Speed Parameters
4. Cross-section
5. Sight Distance
6. Horizontal Alignment
7. Vertical Alignment
8. Coordination of Horizontal and Vertical Alignment
9. Intersections and Auxiliary Lanes
10. Bridge Considerations

Design parameters include: road classification; design speeds; design vehicles; alignment controls; cross-section components, including

travel lanes, shoulders and verges; and provisions for public transport and cyclists.

Speed parameters include: operating speed, desired speed and design speed; and their relationship with each other.

Horizontal and vertical alignments (include development and application of: circular curves; superelevation; grades; vertical curves; procedures for the grading of a road alignment; and determination of sight distances across vertical curves.

Assessment

The following table summarises the standard assessment tasks for this subject. Please note this is a guide only. Assessment tasks are regularly updated, where there is a difference your Learning Guide takes precedence.

Type	Length	Percent	Threshold	Individual/ Group Task	Mandatory
Quiz	Online Quizzes 30 min each	15	N	Individual	N
Intra-session Exam	1 Hour	30	N	Individual	N
Applied Project	Draft Report with 1500 words, including diagrams	25	N	Individual	N
Applied Project	Final Report with 1500 words, including diagrams	30	N	Individual	N

Teaching Periods

Quarter 4 (2025) Penrith (Kingswood)

Online

Subject Contact Abbas Ranjbar ([https://directory.westernsydney.edu.au/search/name/Abbas Ranjbar/](https://directory.westernsydney.edu.au/search/name/Abbas%20Ranjbar/))

View timetable (https://classregistration.westernsydney.edu.au/odd/timetable/?subject_code=ENGR2034_25-Q4_KW_2#subjects)

Hybrid

Subject Contact Abbas Ranjbar ([https://directory.westernsydney.edu.au/search/name/Abbas Ranjbar/](https://directory.westernsydney.edu.au/search/name/Abbas%20Ranjbar/))

View timetable (https://classregistration.westernsydney.edu.au/odd/timetable/?subject_code=ENGR2034_25-Q4_KW_3#subjects)