

Skilled Migrant Training in 12d Model Course Outline & Content

Day 1 Program

- 8:45 – 9:00** **Arrival and Introductions**
- 9:00 – 10:15** **Classwork**
 Load survey data, verify data & triangulate to form a survey surface.
 Procedures for panning/zooming layer control in 12d Model.
 Procedures for plotting from 12d Model
 Draw a layout of proposed road centrelines based on land use and property boundaries.
 Create Road Design Centrelines for the roads. Label chainages and TPs.
- 10:15 – 10:45** **Discussion**
 Discuss road standards, design speeds, RTA standards / LGA standards
 Discuss grading requirements for the road centrelines, maximum and minimum grades, vertical curves, sight lines, RTA standards, Austroads standards, Local Government standards
- 10:45 – 11:00** **Coffee**
- 11:00 – 11:30** **Exercise**
 Working with a new dataset, load survey, triangulate, and create contours.
 Export the contours to DWG file and open in CAD
 Plot a drawing of the Survey and the Contours
- 11:30 – 12:30** **Classwork**
 Review procedures for location of Road Centrelines.
 Create longitudinal section of the existing ground, and create a design of the longitudinal section of two roads.
- 12:30 – 12:45** **Discussion**
 Typical road cross sections. RTA kerb types. Local government requirements for urban and rural roads.
- 12:45 – 1:30** **Lunch**
- 1:30 – 2:30** **Classwork**
 Sketch a 'Template' for the road cross section, then create it in 12d Model.
 Create an MTF file for one of the roads, and an Apply function to generate the road cross sections and strings.
 Open the perspective view and drive on the road.
- 2:30 – 3:00** **Exercise**
 Create MTF file and Apply Many function to generate road cross sections and strings for the second road.
- 3:00 – 3:15** **Coffee**
- 3:15 – 3:30** **Classwork**
 Create plotted sheets of longitudinal and cross sections
- 3:30 – 4:00** **Discussion**
 How to load the 12d Model 'Practise Version'.
 Training resources, and where to find them.
 Discussion of Assignment.



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Day 2 Program

8:45 – 9:00	Arrival
9:00 – 9:30	Discussion Review of Assignment.
9:30 – 10:00	Discussion Discuss ways to define Alignment String. Comparison of I.P. methods and 'Element' methods (also known as 'Parametric' design)
10:00 – 10:45	Classwork Create a Design Centreline for Taylor Road string using Fixed and Floating Elements.
10:45 – 11:00	Coffee
11:00 – 11:30	Classwork Complete the Vertical Design of the Alignment using I.P. design.
11:30 – 12:00	Classwork Use the template created in Day 1 of the course, use an Apply Many function and MTF to create cross sections and strings for the road.
12:00 – 12:15	Discussion Discuss the use of the 'Apply Many' function in comparison to the 'Apply' function.
12:15 – 12:45	Classwork Remove the 'Templates' part of the MTF, and use the 'Insert Template' modifier to create a road between intersections.
12:45 – 1:30	Lunch
1:30 – 2:30	Classwork Use Template Modifiers to create road widening and a bus bay for the road
2:30 – 3:00	Exercise The horizontal design of Hill Road centreline is provided. Create the vertical design, MTF and Apply Many function to create the road.
3:00 – 3:15	Coffee
3:15 – 3:45	Classwork Refine the vertical design of Hill Road and update the cross sections and strings, then use Template Modifiers to create superelevation for the road
3:45 – 4:00	Discussion Discussion of Assignment



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Day 3 Program

8:45 – 9:00	Arrival
9:00 – 9:30	Discussion Review of Assignment.
9:30 – 10:00	Discussion Discuss the RTA's requirements for super elevation, plan transitions, and development lengths.
10:00 – 10:45	Classwork Add plan transitions to the Hill Road design, and update the superelevation for the road. Use the 'Filter' tab on the Apply Many panel to filter cross sections, and plot the cross sections.
10:45 – 11:00	Coffee
11:00 – 11:45	Classwork Use Parametric Design methods to recreate the vertical design of Hill Road.
11:45 – 12:00	Discussion Parametric Design methods compared to I.P. methods. Discuss the concept of Computators
12:00 – 12:15	Classwork Convert the first element of Hill Road vertical design to a Computator. Create a chain to Re-solve the Hill Road centreline, and to plot the new cross sections.
12:15 – 12:30	Discussion Methods of grading kerb return strings Concept of quarter point grading. Stormwater drainage requirements for kerb returns, and reasons for avoiding sag points.
12:30 – 12:45	Classwork Create a vertical design for two kerb returns using quarter point grading. Create templates, MTFs and Apply Many functions for the two kerb returns. Plot longitudinal sections for the kerb returns. Create a Chain to update the design automatically.
12:45 – 1:30	Lunch
1:30 – 2:15	Discussion Stormwater Drainage. Discussion of Rational Hydrology, IFD tables, time of concentration, major & minor events, overland flow paths. Stormwater pits, grates and lintels. Places where stormwater pits are required. Types of stormwater pits. Type and classes of pipes. Cover requirements and minimum grading for pipes. Pipe suppliers, catalogues, online resources
2:15 – 2:30	Exercise Sketch by hand the layout of a pit & pipe network for a small road network.
3:00 – 3:15	Coffee
3:15 – 3:45	Classwork Use 12d Model to layout the network of pits and pipes. Use 12d Model to create vertical design for the network.
3:45 – 4:00	Discussion Discussion of Assignment



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Day 4 Program

8:45 – 9:00	Arrival
9:00 – 9:30	Discussion Review of Assignment.
9:30 – 9:45	Discussion Discussion of potential groups of employers: Local Councils / RTA. Consulting Engineers. Construction Contractors. Expectations of employers, likely duties
9:45 – 10:15	Classwork Create a triangulation of the design created in Week 3. Create a Supertin using the design tin and the existing surface tin. Create contours for the Finished Surface and export the contours to CAD
10:15 – 10:45	Classwork Create batter ticks, setout table, north point and gridlines, and export a General Arrangement drawing to CAD
10:45 – 11:00	Coffee
11:00 – 12:00	Classwork Computators for Horizontal Design. Creating Road Centrelines and Kerb Returns.
12:00 – 12:30	Classwork Automatic Kerb Return Creation.
12:30 – 12:45	Classwork Create Roads – Automatic creation of roads and kerb returns for land subdivision
12:45 – 1:30	Lunch
1:30 – 2:15	Discussion Stormwater Drainage. Inlet rating for kerb inlet pits.
2:15 – 2:30	Classwork Create catchments and bypass flow strings, then analyse the drainage network created in Day 3. Display the width of flow in the road, and the extent of flooding.
3:00 – 3:15	Coffee
3:15 – 3:45	Classwork Earthworks design. Creating and grading pads, creating batters and interfaces
3:45 – 4:00	Discussion Closing discussion, questions, etc.

