



Courses for Surveyors

Terrametra Resources

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TERRAMETRA COURSES

Earth Measurement Mathematics *"from the ground up"*

- ✓ TERRAMETRA is an in-depth set of courses ...
 - for professional surveyors needing to review certain topics.
 - for surveyor interns preparing for their fundamentals exam.
 - for math students interested in real-world applications ...
(algebra - geometry - trigonometry)



TERRAMETRA COURSES

✓ REVIEW TOPIX - (Basic Review)

- BASIC MATH
- ALGEBRA
- GEOMETRY
- TRIGONOMETRY

✓ TERRA METRIX - (Mathematics)

- SURVEY TRIGONOMETRY
- HORIZONTAL SURVEY COMPUTATIONS
- VERTICAL SURVEY COMPUTATIONS
- COORDINATE GEOMETRY

✓ TERRA TOPIX - (Special Topics)

- PUBLIC LANDS
- GEODETIC PROJECTIONS
- GEOSPATIAL REFERENCING



BASIC MATH REVIEW

- ✔ This course is a short, basic review of arithmetic concepts.
- ✔ Topics include the number system from natural numbers up through complex numbers, properties and operations with numbers, ratios, proportions, and percents.
- ✔ Upon successful completion of this review course, students will be able to use basic math to solve problems.



ALGEBRA REVIEW

- ✔ This course is a short, basic review of algebraic concepts.
- ✔ Topics include algebraic expressions; equations of lines, circles, ellipses and parabolas; and simultaneous solutions to line-line, line-circle and circle-circle problems.
- ✔ Upon successful completion of this review course, students will be able to manipulate algebraic equations to solve problems.



GEOMETRY REVIEW

- ✔ This course is a short, basic review of geometric concepts.
- ✔ Topics include points, lines, angles, polygons, and circles.
- ✔ Upon successful completion of this review course, students will be able to relate geometric entities and compute angles to solve problems.



TRIGONOMETRY REVIEW

- ✔ This course is a short, basic review of trigonometric concepts.
- ✔ Topics include right triangle trigonometry, solutions to scalene triangles, and derivation of trigonometric identities.
- ✔ Upon successful completion of this review course, students will be able to use basic trigonometry to compute solutions to a variety of problems.



SURVEY TRIGONOMETRY

- This course introduces the use of basic trigonometry relating to survey calculations.
- Topics include right triangle trigonometry, rectangular and polar coordinate systems, bearings and azimuths, solutions to scalene triangles, and derivation of trigonometric identities.
- Upon successful completion of this course, students will be able to use basic trigonometry to compute solutions to a variety of survey-related problems.



HORIZONTAL SURVEY COMPUTATIONS

- ✔ This course applies concepts learned in Survey Trigonometry to typical surveying problems in the horizontal plane.
- ✔ Topics include networks, intersections, resections, traverse adjustments, radial (circular) and spiral curves.
- ✔ Upon successful completion of this course, students will be able to compute solutions to a variety of survey-related problems.



VERTICAL SURVEY COMPUTATIONS

- This course applies concepts learned in Survey Trigonometry to typical surveying problems in the vertical plane.
- Topics include straight grades, symmetric and asymmetric vertical curves, vertical intersections, vertical alignments and redesigns.
- Upon successful completion of this course, students will be able to compute solutions to a variety of survey-related problems.



COORDINATE GEOMETRY

- This course covers how to use coordinates to solve geometric problems with an emphasis on using a calculator program that will be an aid on the job.
- Topics include coordinate handling, traversing, inversing, intersections, resections, three-point curves, areas (including irregular boundaries and predetermined areas), traverse adjustments, radial (circular) and spiral curves.
- Upon successful completion of this course, students will be able to solve complex surveying problems using coordinate geometry.



PUBLIC LANDS

- ✔ This course covers how to retrace the work of the original surveyors of the U.S. rectangular system.
- ✔ Topics include restoring lost corners and subdividing sections and townships.
- ✔ Upon successful completion of this course, students will be able to break down sections and townships according to accepted practice.



GEODETIC PROJECTIONS

- This course covers how to calculate control surveys utilizing map projections and state plane coordinates.
- Topics include geodetic-to-grid and grid-to-geodetic conversions for angles, distances and coordinates, with an emphasis on calculations in the Lambert Conformal Conic projection and comparisons to calculations in the Transverse Mercator and UTM projections.
- Upon successful completion of this course, students will be able to compute solutions to control surveys using state plane coordinates.



GEOSPATIAL REFERENCING

- This course presents the earth-centered coordinate systems of the astronomical Celestial Sphere as used in surveying and the Global Positioning System (GPS).
- Topics include spherical triangle solutions, the determination of the astronomical meridian by solar observation, and the use of GPS by the surveyor.
- Upon successful completion of this course, students will be able to determine true azimuths based upon astronomical observation and discuss the use of GPS by the surveyor.



Certificates of Completion

✓ REQUIREMENTS:

To receive a "Certificate of Completion" for a course, you must ...

- Complete a series of quizzes (worth 80% of the final grade)
- Complete a final exam (worth 20% of the final grade)
- Achieve a minimum grade of 70% on each quiz and/or final
- Achieve an overall, weighted average for the course of at least 80%

Each course provides information in document form for review and includes "homework" to prepare for the quizzes.



Contact Us ...

Need more information about TERRAMETRA ???

Need tutoring in TERRAMETRA course subjects ???

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