

# Geomatics Tech (GEMT)

---

## Courses

### **GEMT 2231 Survey Computations: 3 semester hours.**

Units of measurement and conversions, check and adjustment of raw data, closure and adjustment of survey figures, calculations for missing elements of a figure, working coordinates and coordinate geometry (COGO), intersections of straight lines and circles, instrument specifications and introduction to adjustment theory. PREREQ: MATH 1143, MATH 1144, CET 1122 D

### **GEMT 3310 Boundary Control and Legal Principles: 3 semester hours.**

Concept of boundaries, ownership, transfer, boundary law principles, presumptions, easements and reversions, sequential and simultaneous conveyances, case studies, Riparian and littoral rights, and priority of calls. PREREQ: MATH 1143, MATH 1144, CET 1122 F, S

### **GEMT 3311 Advanced Surveying: 3 semester hours.**

Discuss theory of errors, total station and electronic distance measurement, relationship between distance and angle, link traverse, control surveys and geodetic reduction, transverse Mercator projection and state plane coordinates, spherical trigonometry and astronomical observation national map accuracy standard and 2D conformal transformation. PREREQ: MATH 1143, MATH 1144, CET 1122 F

### **GEMT 3312 Public Land Surveying: 3 semester hours.**

Study of surveys of public land. Includes a general scheme of subdivision of U.S. public lands, geodetic aspects of the PLSS, township and section subdivision, areas, corner restoration, meanders and irregularities in subdivision. and irregularities in subdivision. PREREQ: MATH 1143, MATH 1144, CET 1122. F, S

### **GEMT 3313 Surveying Software Applications: 2 semester hours.**

Civil/survey software. Topics include data download; editing and processing; COGO functions; field to finish functions; area and lot sizing; INs, DTMs and contours creation; calculation of volumes and basic road design and layout. PREREQ: MATH 1143, MATH 1144, CET 1122. F

### **GEMT 3314 Research and Evidence in Surveying: 3 semester hours.**

Survey of research sources and techniques including field, surveyors' offices, governmental agency, courtroom procedures and practices. Local government agency permit and approval procedures. Surveyor/attorney interaction and roles. Student will work on case studies and prepare a final report. PREREQ: MATH 1143, MATH 1144, CET 1122 F, S

### **GEMT 3315 Surveying Adjustments: 3 semester hours.**

Studies matrix inverse; solution of linear equation by matrices, theory and computation of least squares adjustments, coordinate transformation, error ellipses, and statistical testing. PREREQ: MATH 1170, MATH 1153 and CET 2226. S

### **GEMT 3317 Subdivision Planning and Platting: 2 semester hours.**

Land use planning; governmental regulations and permits as applied to subdivisions; subdivision planning, computations and preparation of subdivision plats. PREREQ: MATH 1143, MATH 1144, CET 1122. F, S

### **GEMT 3319 Writing Legal Descriptions: 1 semester hour.**

Covers description forms and phrases, interpretation and analysis of descriptions and preparation of land descriptions. PREREQ: MATH 1143, MATH 1144, CET 1122. F, S

### **GEMT 4400 Essentials of Surveying: 2 semester hours.**

Covers relevant topics to prepare for the NCEES Fundamentals of Surveying exam. May not be used as a technical elective. May be repeated once for a total of 4 credits. PREREQ: Senior standing, completion of Academic Certificate in Land Surveying, or permission of instructor. F, S

### **GEMT 4411 Geodesy: 3 semester hours.**

Introduces geometry of ellipsoid, reference coordinate systems, deviation of vertical, local geodetic coordinate system, reduction of observation to other geodetic values, dynamic height and orthometric height, direct and inverse geodetic position computation and gravity field of earth. PREREQ: MATH 1143, MATH 1144, CET 1122. S

### **GEMT 4413 Land Information System: 3 semester hours.**

Model of land information system, reference systems, data capture, structure, quality, and implementation of land information system. Student works on a case study and writes a final report. PREREQ: MATH 1143, MATH 1144, CET 1122. D

### **GEMT 4415 Survey Office Practice: 3 semester hours.**

Introduction to the broad skills required of a surveyor running a business. Topics covered include formulating a business plan, forms of business organizations, basic financial forms and accounting, concepts of pricing and bidding, personnel management, marketing, contracts and proposals, and project management. PREREQ: MATH 1143, MATH 1144, CET 1122.. S

### **GEMT 4416 Surveying Project: 2 semester hours.**

An independent study capstone course designed to further develop the skills required of a professional surveyor. Project is selected, designed, and performed under the guidance of a faculty member. A formal presentation and defense of the project to a faculty and peer committee is required. PREREQ: Senior standing or permission of instructor. D

### **GEMT 4425 Principles of Cartography: 3 semester hours.**

Studies history of cartography; theory and practice of cartography including map reading, scales, spatial reference systems, projections, data acquisition, thematic mapping, map simplification, classification, generalization and map design, and computer mapping. PREREQ: MATH 1143, MATH 1144, CET 1122, CET 2228. S

### **GEMT 4430 GPS Principles and Applications: 3 semester hours.**

Introduction to theory and use of GPS for mapping and survey application. Basic principles of GPS positioning, GPS differential techniques, types of GPS receivers, static, kinematic and RTK procedures, vector processing and adjustment, coordinate creation and output, and export of result. PREREQ: MATH 1143, MATH 1144, CET 1122. F

### **GEMT 4432 Principles of Photogrammetry: 3 semester hours.**

Introduction to vertical photo geometry and its scale, relief and tilt displacement, stereoscopic viewing, parallax measurement, mosaics, orientations, development of planimetric and topographic maps, flight planning, softcopy photogrammetry and introduction to aerial triangulation. PREREQ: MATH 1143, MATH 1144, CET 1122. S

### **GEMT 4496 Independent Study: 1-8 semester hours.**

Designed for creative problem solving and for integrating techniques into geomatics. Topics chosen depend upon student's interest or specific need of individuals in the area of surveying, mapping, geodetic surveying, boundary surveying, geodesy, remote sensing, cartography, and photogrammetry. PREREQ: MATH 1143, MATH 1144, CET 1122. D

### **GEMT 4498 Special Topics: 1-3 semester hours.**

Designed for creative problem solving and for integrating techniques into geomatics. Topics chosen depend upon student's interest or specific need of individuals in the area of surveying, mapping, geodetic surveying, boundary surveying, geodesy, remote sensing, cartography, and photogrammetry. PREREQ: MATH 1143, MATH 1144, CET 1122.D