

İnersiyal Ölçme ve INS/GPS Integration (Inertial Surveying and INS/GPS Integration) 3-0-3

Inertial sensors and their application in inertial navigation, existing inertial systems, new developments in strapdown technology. Practical aspects of inertial positioning definition of an operational inertial frame, inertial error models. Effect of inertial sensor errors on the derived navigation parameters, performance characteristics of inertial sensors, calibration of inertial sensors. Mechanization equations in different coordinate frames, step by step computation of the navigation parameters from the inertial sensor data introduction to Kalman filtering for optimal error estimation, modelling INS errors by linear state equations, practical issues for the implementation of update measurements (ZUPT, CUPT, Integrated systems), current research activities.

Kablosuz Konumlama (Wireless Location) 3-0-3

Fundamentals of radio-frequency propagation, principles of radio-frequency positioning, observations and their associated error sources. Introduction to self-contained inertial sensors including odometers, gyros, accelerometers, and augmentation of RF methods with self-contained sensors and other data sources. Current systems: Assisted GPS, cellular telephone location techniques, pseudolites, location with wireless computer networks, ultra-wideband. Applications: outdoor and indoor personal location, asset tracking.

Çevre için Yer Gözlemi (Earth Observation for the Environment) 3-0-3

An introduction to environmental earth observation systems in particular to satellite platforms. Technique for fusing multi-dimensional datasets (i.e., multi-spectral, multi-temporal, multi-resolution, and point-source ground data). A number of environmental issues will be discussed, including carbon sequestration, advanced techniques for estimating biophysical variables that are integral parts of various environmental models; vegetation phenology; and understanding of climatic influence on forested and polar ecosystems, etc.

GNSS Alıcı Tasarımı (GNSS Receiver Design) 3-0-3

Global Navigation Satellite System signal structure, overview of receiver architecture, measurements, antenna design, receiver front-end, reference oscillator, sampling and quantization, phase lock loops, frequency lock loops and delay lock loops, tracking loop design and errors, signal acquisition and detection, interference effects.

Konumsal Veritabanları ve Veri Madenciliği (Spatial Databases and Data Mining) 3-0-3

Comprehensive overview of spatial database management systems and issues related to spatial data mining. The topics that will be covered include: overview of spatial databases, spatial concepts and data models, spatial query languages, spatial storage and indexing, spatial networks, spatial data mining, and trends in spatial databases.

Yersel hesaplama (Geocomputation) 3-0-3

Overview of the fundamental concepts, approaches, techniques, and applications in the field of Geocomputation. Topics being discussed include Geocomputation, Computational intelligence, Complex Systems theory, Cellular automata modelling, Multi-agent system modelling, Calibration and validation of dynamic models, Scale, Artificial neural network, Data mining and knowledge discovery, Geovisualization, and Post-normal science. Individual projects involving the application of Geocomputational techniques and models are conducted.

Konumsal İstatistik (Spatial Statistics) 3-0-3

Spatial phenomena and spatial processes. Spatial data analysis and the importance of spatial data in scientific research. Methods will range from exploratory spatial data analysis through to recent developments such as nonparametric semivariogram modelling, generalized linear mixed models, estimation and modelling of nonstationary covariances, and spatio-temporal processes.

Global Geophysics and Geodynamics 3-0-3

Elasticity, figure of the Earth, Earth structure and seismology, gravity and its temporal variations, isostasy, tides, Earth rotation and orientation, time, plate flexure, glacial rebound, continental drift, geodetic observation methods for geodynamics.

Tides and Water Levels 3-0-3

Detailed studies of the controls on surface water level (tides, waves and swell, vertical reference surfaces). Constituent extraction from tidal observations and prediction of tides. Discrete and continuous tidal zoning, including an introduction to coastal hydrodynamic models.

Marine Geology 3-0-3

Descriptive marine geology including all ocean depths, but focusing on the coastal zone and continental shelf. Components of surficial sedimentology that affect the accuracy and operational conduct of hydrographic surveying. Detailed studies of the controls on seafloor processes (deposition and erosion) and bottom backscatter strength (sonar performance, geomorphology, sediment classification).

Kinematic Positioning 3-0-3

Performance requirements, mathematical models, observation methods, processing strategies, uncertainties and other characteristics associated with moving marine, land airborne, and space vehicle positioning, orientation and attitude applications, using autonomous, terrestrial, satellite, and acoustic methods.

Mining Surveying 3-0-3

Introduction to mining engineering. Mapping of open pits and underground mines. Shaft plumbing; use of lasers; use of gyrotheodolites. Tunnelling surveys. Rock deformation measurements. Monitoring and analysis of ground subsidence.

Hydrographic Data Management 3-0-3

Principles and use of hydrographic data management tools which acquire, clean, store, retrieve, select, interpolate, determine uncertainty, colour-code, and visualize individual and aggregated high density observed depth data points. Hydrographic data layering, analysis, artificial illumination, texturing, and animation. Visualization requirements and standards for safety of navigation.

Land Economy and Administration 3-0-3

Introduces land management and administration from economic and institutional perspectives. Evolving concepts of property and land tenure systems. Role of property institutions in land management. Economic principles in the valuation, allocation, development, and conservation of land resources. Land administration and land information systems. Special issues such as coastal zone management, environmental management, aboriginal tenure, and land reform.

Marine Policy, Law and Administration 3-0-3

Coastal and marine [offshore] legal issues and how they relate to the framework of policy and administration. Focuses primarily on Canadian legal and policy regime, drawing on international law and practice where appropriate. Law of the sea and delimitation of zones and boundaries; Canadian coastal and offshore jurisdictional and administrative issues; coastline delimitation for various purposes; legal issues related to hydrographic surveys, hydrographic data, and marine accidents. Legal principles involved when designing and planning various marine surveys.

Exploration and Surveying in Literature and the Arts 3-0-3

A complementary studies elective examining the place and portrayal of exploration and explorers and surveying and surveyors in contemporary and historical literature and, also, in the arts, especially in print media, painting, photography, and the cinema. Open to geomatics engineering students in their final year of their programme.

Uzaktan Algılamada Afet Uygulamaları 3-0-3

Giriş. Afet yönetimi. Afet yönetiminin bileşenleri. Doğal afetler. Teknolojik afetler. Global ve lokal afetler. Tehlike analizi. Zarar azaltma stratejileri. Hasar tespiti. Afet yönetimi bazlı CBS sistemi. Veri elde etme ve entegrasyon. Uzaktan algılama görüntü verileri. Görüntülerin sağladığı bilgi içeriği. Görüntülerden detay çıkarma yöntemleri. Vektörizasyon. Görüntülerin segmentasyonu ve sınıflandırılması. Piksel-tabanlı ve nesne-tabanlı sınıflandırma yaklaşımları. Afet yönetiminde Coğrafi Bilgi Sistemi ve Uzaktan Algılama uygulamaları. Afet senaryolarının oluşturulması. Uygulamalar.