T.C.

ONDOKUZ MAYIS UNIVERSITY

FACULTY OF ENGINEERING-GEOMATICS ENGINEERING

MASTER PROGRAM COURSE CONTENTS (2019-2020)

JFM601, Numerical Analysis   **3-0-3**

Number systems, rounding decimal numbers. Determination of significant steps in calculations, Calculation errors, Solution methods of algebraic equations, Iterative solutions, Convergence, Direct solution, Solution of linear equations, Calculation of inverse matrices, Gauss method, Pivot method, Eigenvalues and Eigenvectors of matrices, Conduction of matrices, Generalized inverse matrix, Pseudo inverse matrix, Inverse of Moore-Penrose, Interpolation methods.

JFM602, Advanced Programming   **3-0-3**

Functions of compiler, data types and commands, Memory requirement, Memory management, Algorithms, Advanced programming expressions, Optimization of arithmetic expressions, Processing the input/output and format expressions in compiler, Using storage media, Debugging, Functions, pointers, software design and applications.

JFM603, Statistics   **3-0-3**

Probability concept, Probability axioms, Repetitive experiments, Concept of random variable, Functions with a random variable, Prediction theory, Decision rule, Statistical tests, Regression and correlation, Variance analysis.

JFM604, Coordinate Transformations   **3-0-3**

Transformation concept, geodetic and photogrammetric coordinate transformations, Coordinate systems, Two dimensional linear transformations, Similarity, affine and projective transformations, Second and higher degree non-conformal transformations, transformation with least squares adjustment, Transformation applications, Three dimensional transformations.

JFM605, Special Topics in Adjustment   **3-0-3**

Adjustment of correlated measurements, Effects of correlations, Adjustment of indirect measurements with the constraints of unknowns, Grouping the observation equations, Grouping the constraint equations, Splitting and merging the triangulation networks, Adjustment functions, Collocation, Adjustment of free networks.

JFM606, Surveying Instruments   **3-0-3**

Components of geodetic instruments, optic, monocular, bubble level, axes, angle reading mechanisms, levels, theodolites, axes and their errors.

JFM607, Digital Terrain Models   2-0-2

Digital terrain models, concepts and application fields, Data acquisition, Density and distribution of points, The relief parameters of the field, Field classification, Interpolation methods, Weighted averages, Linear interpolation, Bilinear interpolation, biquadratic interpolation, Interpolation with moving surfaces, Linear least squares interpolation, Interpolation with multiquadratic surfaces, Numerical applications on these methods.

JFM608, Remote Sensing   3-0-3

Remote sensing approaches, principles and application fields. Remote sensingsystems. Multi-spectral and thermal sensors. Electromagnetic spectrum, sensors and platforms. Assesment of remotely sensed images. Geometric and radiometric correction of images. Investigation of the accuracy of the RS images.

JFM609, Computer Aided Cartography   3-0-3

Basic definitions and concepts, data organization and integration, basic transformations, cartographic data processing, computer graphics, arrangement of map contents, cartographic databases, interactive graphic display interfaces, automatic drawing systems, applicability of cartographic digital components.

JFM610, Terrestrial Photogrammetry   3-0-3

Terrestrial metric cameras. Ameteur cameras for close range photogrammetry. Ground control points, optimisation of pose station network. Data acquisition, processing of digital images by using digital and analytic photogrammetric methods.

JFM611, Engineering Surveyings (Aplication)   2-0-2

Classification and definition of measures, factors affecting the implementation of applications, line, circle, clotoid, cubic prabol, lemniskad and other curve applications, using hoop and parabola in vertical curves, tunnel application, parcel application

JFM612, Physical Geodesy   3-0-3

Gravitational force and potential, total orthogonality theorem of global functions, Edge-value problems, e centrifugal force and potential, Nivo plumb surfaces and curves, Height anomalies and vertical deflection, Stokes, Vening, Meinesz formulas, topographic isostatic reduction of Plumb deviation, three-dimensional surveying / measuring the reduction / astronomical leveling Height systems, presence of ellipsoid dimensions, placement and routing methods of national triangulation networks

JFM613, Advanced Models in Digital Photogrammetry and Algorithms   3-0-3

Advanced models usen in photogrammetric systems and their implementation in C#. Measurement of image coordinates; area, feature and templete based matching techniques. Filter design for sub-pixel coordinate measurements. Digital orthophoto and its mathematical background. Confidence tests of the instructed techniques.

JFM614, Digital Image Processing and Understanding Techniques   3-0-3

The methods of digital imaging. Geometric and radiometric resolution. Image enhancement and restoration techniques. Geometric image transformations and resampling the radiometry. Image segmentation techniques. Image classification. Image labeling algorithms. The use of image processing techniques in photogrammetry and remote sensing. Implementation of the image processing techniques in C#.

JFM615, Analysis and Queries in Geographical Information Systems   2-0-2

Spatial analysis in Geographic Information Systems (GIS), Topological data structures and topology, Topological overlay analysis, Proximity analysis, Buffer zone creation, Network analysis, Finding the optimum route, location selection, vector and raster data analysis, surface analysis, spatial statistics

JFM616, Developping 3D Softwares With Visual C++ And Opengl   3-0-3

The basics of the solid modelling and OpenGL. OpenGL APIs and their use in C#. Virtual reality and photo-reality concepts. Texture mapping. Volume and surface modeling. Developing 3D solid reconstruction and visualization programs as well as texture mapping. Advanced 3D modelling algorithms.

JFM617, Science-Phylosphy and Model Reality Consepts   3-0-3

Phylosophical ideas and their effects on progress of positive sciences. Effects of positive sciences on phylosphy. Ideal concepts which can be used for modelling physical reality. Proof methods of reduction, induction and contraction. Platonism, formalizm and constructivisizm. Relations between mathematical model and physical reality. Interpretation of discussion of mathematical models with the above context.

JFM618, Coastal Management   3-0-3

Description of Coastal Areas, Coastal Management and General Concepts in Planning, Coastal Zone Management, the Public Interest in the Use of Coastal Areas, Planning of Coastal Zones, Coastal Planning in Turkey and New Initiatives, Issues Management of Coastal Areas, Management Photogrammetry of the Coastal Zone, Remote Sensing and GIS use, Conclusion and Evaluation.

JFM619, Urban Land Arrangement   3-0-3

Urbanization in Turkey, Zonning plans and their implementations, Land compensation, Land readjustment, Problems and defects at the applications of zonning plan implementations in

Turkey, Land Valuation, Consept of Urban Transformation and its implementation, result and generally evaluation.

JFM620, Surveying Technique And Organization in Rural Land Arrangement 3-0-3

Fundamental principles in Rural Land Arrangement, The methods of rural land arrangement, rural land arrangement and implementations in Turkey, implementations of rural land arrangement, land consolidation in rural land arrangement, Targets, planning and application of land consolidation, Connection of land consolidation with cadastre, Importance of survey in land consolidation, technical and juridical problems at the land consolidation, Economical, technical and legal aspects of land consolidation, implementation examples. Surveying phases in land arrangement, surveying and interpretation, Conclusion and Suggestions.

JFM621, Global Positioning System   3-0-3

Definitions in Satellite geodesy and its applications. Positioning theory and methods in satellite geodesy: Optical systems, Transit, Argos, SLR, VLBI, Galileo, GLONASS, and GPS. Signal structure of the GPS, GPS observations: code and carrier phase measurements. Errors and biases at GPS measurements. Differencing techniques. Mathematical models used in evaluation of the GPS observations. Positioning methods in GPS: Static, kinematic, and RTK methods.

JFM622, Methods of Estimating in Geodesy   3-0-3

Methods of Estimating Parameter, Gauss-Markoff Model and applications in Geodesy, Method of Least Squares, Maximum-Likelihood method, Regression model, Estimation of variance and covariance components, Robust parameter estimation, fuzzy logic estimations method.

JFM623 Statistical Analysis of Data in Geodesy   2-0-2

Statistical data distributions, establishment of mathematical model, functional and stochastic models, model hypothesis test, incompatible measures test, redundanz matrix, sensitivity and reliability criteria, significance test of balancing results.

JFM624, Deformation Measurements and Analysis   3-0-3

History of deformation measurement and analysis, establishment and design of deformation Networks, deformation measurements, adjusted of deformations network, analysis methods of deformation measurements, Mierlo, Robust and Cholesky factoring methods. Graphical interpretation of deformations.

JFM625, Interoperability Infrastructures for SDI   3-0-3

Spatial Data Infrastructures (SDI), Local, National and Global SDIs, Interoperability, Interoperability Infrastructures, Java RMI, CORBA and Web Services, SDI Implementations, Clearinghouses and GeoPortal, Review of the related work of International Standards

Organization, Evaluating the NSDIs of the USA and other countries, An evaluation of the current status and future trends in the area with respect to the case of Turkey.

JFM626, Web GIS Technologies and Architectures   2-2-3

WebGIS Concept, WebGIS Architectures, WebGIS Technologies; HTML, CGI, ASP, ODBC, JDBC, Java, XML, GML, and SVG, Open GIS Concept and Interoperability, Open GIS Architecture, Open GIS Technologies, Developing WebGIS applications using OpenGIS Technologies, Developing WebGIS applications using HTML, CGI, Visual Basic, ASP, and Access.

JFM627, Geometrical Principles and Current Applications of GIS   3-0-3

Using of basic geometrical principles in GIS. Concept of the topology. Common GIS software. The basic GIS applicationsi Queries and analysis in GIS. Multidisciplineer GIS aplications and preparing sample project development

JFM628, Land Management   3-0-3

Land manegement concept, principle of land management and application methods, scope of cadastre and land registry, ownership concept, land readjusment, principle and application of real estate management and real estate appraisal. Parcel based information systems, spatial data infrastructure, land management in e-government and e-ownership portals.

JFM629, Land Valuation   3-0-3

Real estate, ownership and valuation concepts and importance of land valuation. Valuation legislations and methods. Determining of factors that effects value of land in valuation and unit value calculation. Valuation in privatization. Determining and updating of land valuation indexes. Instutional regulations. Producing and evaluating of land value maps. Using GIS in land valuation

JFM630, Acquisition of Immovable Property by Foreigners   3-0-3

Introduction. Reciprocity Principle. Real property acquisition of foreigners in EU member and candidate countries. Restrictions. Examining the laws and regulations about the topic. The history of European Union (EU) . Examining the topic in view of urban and agricultural areas.

JFM631, Spatial Data infrastructures for GIS   3-0-3

Information systems and technologies, basic concepts of GIS, Project development and management in GIS, data types, raster data, vector data, spatial objects, data models, UML (Unified Modelling Language), XML (eXtensible Markup Language), GML (Geographic Markup Language). Spatial Database Management Systems.

JFM632, Advanced Cadastre Theory   3-0-3

Historical development of cadastre, The Directorate of Land Registry and Cadastre, Land property and historical background of cadastre, Legislation related to cadastre; Methods

executed in the cadastre and evaluation; Fulfilling transactions in the cadastre; Fulfilling technical works in the cadastre; Observing changes in the cadastre; Modern cadastre applications. The concept of land administration.

JFM633 GIS-Based Multi-Criteria Decision Analysis   3-0-3

Geographical Information Systems (GIS) and Multi-criteria Decision Analysis (MCDA), GIS-Based Multi-Criteria Decision Analysis (GIS-MCDA), Problem Definition, Determination of evaluation criteria, Standardization of criterion layers, Assigning the criteria weights, Decision Making Methods, Applied Project.

JFM634 GIS and Remote Sensing in Environmental Management and Planning 3-0-3

Importance of environmental management and planning, The concepts and applications of Geographical Information Systems (GIS) and Remote Sensing as a tool in environmental management and planning, Principles of remote sensing and data acquisition, Digital image processing techniques, Image classification and accuracy assessment, GIS and spatial databases, Map projections, Data structures, data management, manipulation, 3-D modeling and spatial analysis, Map output generation.

JFM635 Disaster Management with GIS and Remote Sensing   3-0-3

Disaster management: Basic Concepts, Disaster management in our country and world, Consideration of the disaster legislation in our country, Components of disaster management, the use of (Geographical Information Systems) GIS and remote sensing technologies for disaster management, Data generation and integration, Remote sensing data, Risk and hazard analysis, Disaster early warning and control systems, the creation of disaster scenarios, Applied Project

JFM636 Intelligent Sensor Networks   3-0-3

Introduction to intelligent sensor networks. The fields in which the intelligent networks are used. Use of intelligent sensors in photogrammetry, remote sensing and geographical information systems. Localization of intelligent sensors. Measurements used for localization of the sensors. Surveillance and target tracking with intelligent sensors. Calibration of sensors and the networks. Meaning and reasoning in sensor networks. Mathematical or formal logic; semantic, syntax and reasoning rulues. Development of intelligent softwares.

JFM637, Engineering Photogrammetry   3-0-3

Definition of close range photogrammetry, Fundamentals of digital Photogrammetry, Development of methodology and systems, Real-time photogrammetry, Fundamental measurement algorithm and techniques, Network design, Definition of the Engineering Photogrammetry, Architectural and archaeological photogrammetry, Medical photogrammetry, Photogrammetry in the industrial applications, Photogrammetry in the aircraft and car industry, Photogrammetry for the control of the nuclear power plants, Digital Photogrammetry Software Packages and applications.

JFM638, Environmental Modelling with GIS and Remote Sensing   3-0-3

Environmental Modelling With GIS And RS - An Overview, Environmental Mapping And Monitoring - A Global Perspective, Spatial Data, Data Input And Output, Data Management, New Sensors For Environmental Mapping, Integration Of Remotely Sensed Data Within GIS, Case Studies: Subsurface Mapping And Monitoring Of Soil And Water Properties, Pollution Detection And Natural Hazard Assessment, Vegetation Mapping And Detection Of Environmental Change, Land Use Planning And Environmental Impact Assessment, Seminar.

JFM639, Scientific Research Methods and Ethic   3-0-3

The concept of scientific publication ethics, Scientific research and scientific research processes, The concept of scientific publication ethics and basic principles of publication ethics, Scientific research methods, Legal legislation about research and publication ethics in our country, Data collection processes and analysis methods, Publication ethics and basic principles, Scientific

JFM640, Entrepreneurship and Innovation   3-0-3

Entrepreneurship concept, the importance of entrepreneurship and historical development of the entrepreneur's personality traits, entrepreneurial processes, culture and benefits, entrepreneurship in Turkey, Entrepreneurship Types, creativity, concept and business idea, the basic functions of business, business plans and sections, sample business plan preparation, project preparation , innovation, utility model, and patent concepts, patenting processes, types of national and international projects.

JFM 641 Planning and Sustainability in Coastal Areas   3-0-3

Importance and Use Principles of Coastal Areas, Activities in Coastal Areas, Coastal Structures, Principles of Coastal Utilization, Coastal Planning Principles, International Approaches in Coastal Areas, Concept of Sustainability, Sustainable Development in Coastal Areas, Control and Prevention of Pollution in Coasts,