Samsun University – Kavak Vocational School

Architecture and Urban Planning Department

Geographic Information Systems Program Course Contents

I. Semester

Course Code	Course Name	T	P	L	ECTS	C	Hours	Type
ATİ101	Atatürk's Principles and Revolution History-I	2	0	0	2	2	2	Compulsory
Concepts and Ottoman modernization. European developments, Industrial Revolution and French Revolution. New Ottomans, Constitutional Monarchy and Union and Progress Society. II. Constitutional Monarchy Period, Tripoli and Balkan Wars. Causes of World War I. World War I: Sharing the Ottoman Empire. National Struggle preparatory period. Congress. Sivas Congress, the last Ottoman Parliament and the National Pact. TBMM Period: Formation of fronts. Treaty of Lausanne.								
Course Code	**Course Name**	**T**	**P**	**L**	**ECTS**	**C**	**Hours**	**Type**
CBS101	Introduction to Geographic Information Systems	4	0	0	6	4	4	Compulsory
Information System Concept. Geographical Information System Concept and Definition. Geographical Information System History. Geographical objects and GIS. Geographical Information System Applications. Geographical Information System Components. Geographical Information System Softwares. Data, Data Models and Spatial Data Concept. Data Collection Techniques in GIS. Map Projections and Coordinat Systems. Urban Information Systems. Land Information Systems. Decision Support Systems.								
Course Code	**Course Name**	**T**	**P**	**L**	**ECTS**	**C**	**Hours**	**Type**
CBS103	Information and Communication Technologies	1	1	0	3	2	2	Compulsory
Document Processing, Forming Processes. Document Controller, Print, Table Operations. Object Operations, Advanced Features. Macros, Customization. Workspace, Data Entry, Formatting Operations. Formulas, Functions. Data Analysis. Print, Macros, Customization. Slide Objects, Display Settings. Print, Privatization. Internet Concepts. Access Database.								
Course Code	**Course Name**	**T**	**P**	**L**	**ECTS**	**C**	**Hours**	**Type**
CBS105	Introduction to Database	3	0	0	3	3	3	Compulsory
What is a Database? Database Basic Concepts. Data Structure in Geographic Information Systems. Data Model. Domain (Value Field). What is SQL? Data Types Used in SQL. Normalization (Decomposition). Databases in GIS. Modelling. Spatial Database Structure. Spatial Modeling. In which fields are databases used?								
Course Code	**Course Name**	**T**	**P**	**L**	**ECTS**	**C**	**Hours**	**Type**
CBS107	Spatial Thinking	3	0	0	3	3	3	Compulsory
What is the Spatial Thinking? The Nature and Functions of Spatial Thinking. Spatial Thinking in Everyday Life, at Work, and in Science. Teaching and Learning About Spatial Thinking. Responding to the Need for Spatial Thinking. Tools for Thought: The Concept of a Support System. Spatial Thinking in National Education Standards. High-Tech Support Systems for Spatial Thinking. An Assessment of GIS as a System for Supporting Spatial Thinking. GIS as a Support System for Spatial Thinking. Supporting Spatial Thinking in the Future. The Spatial Thinker.								
Course Code	**Course Name**	**T**	**P**	**L**	**ECTS**	**C**	**Hours**	**Type**
CBS109	Cartography	2	0	0	3	2	2	Compulsory
Definition of cartography, its importance in geography. Maps as a communication tool. Historical development of cartography: Ancient to Medieval ages. Historical development of cartography: Renaissance to present. Map projections. Classification of projections: Projection surface. Classification of projections: Surface location. Classification of projections: Source of light and contact. Coordinate systems and transforms. Map types, map layout elements (title, scale, legend etc). Map drawing techniques (symbolisation, generalisation, exageration etc.). Drawing elements, Lines, text and numbers, symbols. Hatching and coloring techniques, Color theory and color systems, Data classification techniques.								
Course Code	**Course Name**	**T**	**P**	**L**	**ECTS**	**C**	**Hours**	**Type**
TDİ101	Turkish Language-I	2	0	0	2	2	2	Compulsory
Definition of language. The relationship between nation and language. The relationship between language and culture. Family of languages, the place of Turkish language among other languages. Historical development of Turkish language. The current situation of Turkish language, its history and current examples, vernacular, accent, dialect. Definition of grammar and its sections, features of Turkish language. Phonetic, phonetic of Turkish, its features and classification of phonemes. Grammatical rules of Turkish. Punctuations. Word structure of Turkish and particles, derivational affix, inflexional suffix.								

Course Code	Course Name	T	P	L	ECTS	C	Hours	Type
YDİ101	Foreign Language-I	2	0	0	2	2	2	Compulsory
Greetings. Brainstorming about the mutual expectations. Ice breakers. To be. Possessive adjectives. Countries. Describing jobs. Simple present tense. Word order. WH questions. Expressing likes/dislikes. Foods and drinks. Ordering. Speaking about food from all over the World. Writing and speaking about free time activities. Making dialogues using frequency adverbs. Reading passage about basketball and vocabulary practice. Talking and writing about what people are doing. Using present progressive. Understanding the polite rules of talking on the phone and acting. Talking about past events using simple past tense. Was/were. Understand an article about past and present.								
Course Code	**Course Name**	**T**	**P**	**L**	**ECTS**	**C**	**Hours**	**Type**
CBS151	Basic Mathematics for Geographic Information Systems	2	0	0	3	2	2	Elective
Basic Concepts. Clusters. Numbers and Functions. Exponential and Power Numbers. Algebraic Expressions. Equations and Non-Equations. I. and II. Order Equations. II. Order Equations and Relationships. Functions. Relationships. Rate and Proportions. Problems Related with Rate and Proportions.								
Course Code	**Course Name**	**T**	**P**	**L**	**ECTS**	**C**	**Hours**	**Type**
CBS153	Basic Statistics for Geographic Information Systems	2	0	0	3	2	2	Elective
Basic Statistical Concepts. Measures of Central Tendency. Frequency Distribution. Probability Distribution Models. Confidence Intervals. Hypothesis Tests. Regression and Correlation. Geostatistical Analysis. Spatial İnterpolation Techniques. Spatial Interpolation Techniques Application.								

II. Semester

Course Code	Course Name	T	P	L	ECTS	C	Hours	Type
ATİ102	Atatürk's Principles and Revolution History-II	2	0	0	2	2	2	Compulsory
Political revolutions: Abolition of the Sultanate, Declaration of the Republic, Abolition of the Caliphate. Political parties and political events established in the period of Atatürk and represented in the Turkish Grand National Assembly. Legal reform and legal order. Revolutions in education. Revolutions in culture and social area. Revolutions in economic area. Turkish foreign policy in Atatürk period (1923-1930). Turkish foreign policy in Atatürk period (1930-1938). Principles of Atatürk and complementary principles. After Atatürk's Turkey.								
Course Code	**Course Name**	**T**	**P**	**L**	**ECTS**	**C**	**Hours**	**Type**
CBS102	Introduction Applications to Geographic Information Systems	1	2	0	6	2	3	Compulsory
GIS, Basic Concepts, Basic Map Information. ArcGIS Technology Overview. Analysis of Geographical Data in ArcMap Environment. Data Display Functions. Symbology, Labeling and Cartographic Production in ArcMap. Questioning and Reporting of Geographical Data. Data Entry in ArcMap. Other Tools for Feature Creation. ArcCatalog Applications. Data Conversion Functions. Geodatabase Functions. ArcToolbox and ModelBuilder.								
Course Code	**Course Name**	**T**	**P**	**L**	**ECTS**	**C**	**Hours**	**Type**
CBS104	Land Management and Geographic Information Systems	3	0	0	4	3	3	Compulsory
Regulations of Urban development planning. Informations about urban development planning. Optional urban development planning applications. Necessary urban development planning applications. Applications of land allotment plan. Land management and GIS. GIS applications in land management. GIS desing for land management. Applications of reform urban development planning. Application of land consolidation. Decision support system in land management. Integrated land management.								
Course Code	**Course Name**	**T**	**P**	**L**	**ECTS**	**C**	**Hours**	**Type**
CBS106	Photogrametry	2	0	0	4	2	2	Compulsory
Definition of photogrammetry, its history, application fields and classification of photogrammetry. Photogrammetry and remote sensing. Flight plans. Coordinate systems in photogrammetry. Photogrammetric cameras. Analog and digital images. Digital image processing. Model and column binding. Perspective distortions of images. Restoration of perspective effects in mono images. Digitization. Digital terrain elevation models. Creating layouts. Orthophoto. Photogrometric applications in GIS. Digital photogrometric applications in GIS.								

Course Code	Course Name	T	P	L	ECTS	C	Hours	Type
CBS108	Database Applications	1	1	0	4	2	2	Compulsory
The Spatial Data Model. The Spatial Database Overview. The Spatial Database and Vector Datas. Spatial Database and Raster Datas. The Spatial Database Elements. Topology in The Spatial Database. The Spatial Database Design. The Spatial Database and Version Management.								
Course Code	**Course Name**	**T**	**P**	**L**	**ECTS**	**C**	**Hours**	**Type**
CBS110	Intership	0	0	0	10	0	0	Compulsory
Recognize the work place, to learn about the work done. Learn the planning and applications of workplace workflow. Examine the business practices, participate in practice and studies are to report.								
Course Code	**Course Name**	**T**	**P**	**L**	**ECTS**	**C**	**Hours**	**Type**
TDİ102	Turkish Language II	2	0	0	2	2	2	Compulsory
Definition of language. The relationship between nation and language. The relationship between language and culture. Family of languages, the place of Turkish language among other languages. Historical development of Turkish language. The current situation of Turkish language, its history and current examples, vernacular, accent, dialect. Definition of grammar and its sections, features of Turkish language. Phonetic, phonetic of Turkish, its features and classification of phonemes. Grammatical rules of Turkish. Punctuations. Word structure of Turkish and particles, derivational affix, inflexional suffix.								
Course Code	**Course Name**	**T**	**P**	**L**	**ECTS**	**C**	**Hours**	**Type**
YDİ102	Foreign Language II	2	0	0	2	2	2	Compulsory
Talking about clothes. Using comparative adjectives. Making dialogues about shopping. Speaking activity about fashion. Describing appearances and personalities of people, Using “be like” and “look like”. Speaking and writing activity about describing our friends. Talking about tourist sites. Using can/can’t. Listening and comprehending a passage about city attractions. Talking about places around town. Using “There is” and “There are”. Reading a text about favourite places around town and vocabulary gain. Talking about vacation activities. Using past tense. Reading text about describing a hotel. Talking about future plans. Using future tense. Listening activity about travel plans and follow-up activities. Reading text about travel activities.								
Course Code	**Course Name**	**T**	**P**	**L**	**ECTS**	**C**	**Hours**	**Type**
CBS152	Creating and Publishing Maps	2	0	0	3	2	2	Elective
The cartographic planning process. Selecting and evaluating data. Choosing a coordinate system. Elements of map design. Qualitative and quantitative symbols. Advanced symbology techniques. Generalization. Symbolizing elevation. Working with map labels. Creating and editing annotation. Map layout. Map element design. Map output.								
Course Code	**Course Name**	**T**	**P**	**L**	**ECTS**	**C**	**Hours**	**Type**
CBS154	Techniques of Location Finding	2	0	0	3	2	2	Elective
Positioning techniques. GNSS working principle and GNSS satellites. The concept of accuracy and error in GNSS measurements. GNSS recievers. GNSS positioning methods. Coordinate mesaurement using GNSS. GNSS applications for navigation. GNSS applications for geodetic purposes. Geodetic networks in the World and Turkey. Real time GNSS networks. RTK-GNSS applications, NRTK-GNSS applications. GNSS processing. Reporting and archiving in GNSS measurements.								

III. Semester

Course Code	Course Name	T	P	L	ECTS	C	Hours	Type
CBS201	Remote Sensing	2	0	0	3	2	2	Compulsory
Introduction to Remote Sensing. Electromagnetic Energy and Its Properties. Passive Sensors. Active Sensors. Platforms. Image and Features. Image Correction. Image Enhancement and Interpretation. Image Classification and Accuracy Determination. GIS and Remote Sensing Relationship. Satellites and Properties. Remote Sensing Softwares. Remote Sensing Applications.								
Course Code	**Course Name**	**T**	**P**	**L**	**ECTS**	**C**	**Hours**	**Type**
CBS203	Project Design and Management in Geographic Information Systems	3	0	0	5	3	3	Compulsory
What is Project and Project Management? Spatial Thinking. Spatial Thinking in Geographic Information Systems. Modeling the World. Project Design in GIS. Project Management and Objectives in GIS. Project Design Methodology in GIS. Decision Making in GIS Projects.								
Course Code	**Course Name**	**T**	**P**	**L**	**ECTS**	**C**	**Hours**	**Type**
CBS205	Open Source Geographic Information Systems Applications	1	2	0	4	2	3	Compulsory
The Interface. Creating a Basic Map. Classifying Vector Data. Creating Maps. Creating Vector Data. Vector Analysis. Raster Data. Completing the Analysis. Plugins. Online Resources. QGIS Server. GRASS. Database Concepts with PostgreSQL Spatial Database Concepts with PostGIS.								

Course Code	Course Name	T	P	L	ECTS	C	Hours	Type
CBS207	Building Geodatabase	1	2	0	4	2	3	Compulsory
Exploring the geodatabase. Creating and loading data. Managing raster data. Maintaining data integrity using subtypes. Maintaining attributr integrity. Relating data using relationship classes. Adding attachments. Designing geodatabase topologies. Sharing geodatabase. Designing a geodatabase.								
Course Code	**Course Name**	**T**	**P**	**L**	**ECTS**	**C**	**Hours**	**Type**
CBS209	Spatial Analysis in Geographic Information Systems I	2	2	0	5	3	4	Compulsory
GIS and Spatial Analysis. ArcGIS 3D Analysis Extension and Capabilities. Digital Elevation Models. Surface Analysis and Data Conversion. Working with LIDAR and Terrain Data. 3D Modeling (ArcScene-ArcGlobe). ArcGIS Spatial Analysis Extension and Capabilities. Distance and Density Analysis. Interpolation. Statistical Analysis. Reclassification and Superposition of Raster Data.								
Course Code	**Course Name**	**T**	**P**	**L**	**ECTS**	**C**	**Hours**	**Type**
CBS211	Applications of Geographical Information Systems in Public Sector	3	0	0	3	3	3	Compulsory
Central Management. Preliminary Studies for GIS Applications in Central Government in Turkey. Central Government in cbsuygul updates in Turkey I: T. C. Institutions affiliated to the Prime Ministry. GIS Applications in Central Government in Turkey II: Urbanization Ministry of Environment. GIS Applications in Central Government in Turkey III: Urbanization Ministry of environment. GIS Applications in Central Government in Turkey IV: Ministry of Energy and Natural Resources. GIS Applications in Central Government in Turkey V: Ministry of Agriculture and Forestry. GIS Applications in Central Government in Turkey VI: Ministry of Agriculture and Forestry. GIS Applications in Central Government in Turkey VII: The Ministry of National Defense and the Naval Forces. GIS Applications in Central Government in Turkey VIII: The Ministry of Transportation and Infrastructure. GIS Applications in Central Government in Turkey IX: Treasury and Ministry of Finance. GIS Applications in Central Government in Turkey X: Ministry of Interior. Satellite Image Data Download Applications via GIS Portals.								
Course Code	**Course Name**	**T**	**P**	**L**	**ECTS**	**C**	**Hours**	**Type**
CBS251	Geographic Information Systems Applications in Disaster Management	2	2	0	3	3	4	Elective
Definition of Disaster. Disaster Management. Disaster Management and GIS. Flood and GIS. Disaster Management and GIS Applications I: Flood Risk Analysis. Earthquake and GIS. Disaster Management and GIS Applications II: Earthquake Risk Analysis. Landslide and GIS. Disaster Management and GIS Applications III: Landslide Risk Analysis.								
Course Code	**Course Name**	**T**	**P**	**L**	**ECTS**	**C**	**Hours**	**Type**
CBS253	Urban Information Systems	2	0	0	3	2	2	Elective
Urban Knowledge. Concepts Related to KBS. Urban Information and Spatial Data. Usage and Application Areas of KBS. KBS Data, Resources and Quality. Data Preparation. Spatial Data Analysis in KBS. Data Management. KBS Industry and KBS Software Organizations. KBS on the Internet. Data Visualization in KBS. KBS Case Studies.								
Course Code	**Course Name**	**T**	**P**	**L**	**ECTS**	**C**	**Hours**	**Type**
CBS255	Spatial Data Standards and Infrastructure	2	0	0	3	2	2	Elective
Spatial Data Standards concept definition. The importance of spatial data standards Standard requirements in Turkey. Application area of spatial data standards. Spatial data quality and standards. Interoperability concept. INSPIRE Standards and application. OGC Standards. OGC Standards application. ISO Standards. ISO Standards application. W3C Standards. W3C Standard applications.								

IV. Semester

Course Code	Course Name	T	P	L	ECTS	C	Hours	Type
CBS202	Remote Sensing Applications	1	1	0	3	2	2	Compulsory
Basic Concept Examples in Remote Sensing Programs. Image Merge Applications. Differential Analysis Applications. Controlled and Uncontrolled Classification Examples. Three Dimensional Analysis and Modeling Applications. Topographic Analysis Applications. Modeling and Analysis Applications on Model. Coordination Applications. Applications for Printing Output Format. Vegetation Identification Applications. Image Processing and Accuracy Analysis Applications. Color Band Combination Applications. Classification Applications, Raster and Vector Data Transformation Applications.								
Course Code	**Course Name**	**T**	**P**	**L**	**ECTS**	**C**	**Hours**	**Type**
CBS204	Web Geographic Information Systems	1	2	0	5	2	3	Compulsory
Cloud Computing. Cloud Computing and Geographic Information Systems (GIS). GIS Resources Online Sharing. Ready-to-Use Content Management. Create Web Applications Using ArcGIS Online. Layers, Maps and Applications in Web GIS. Hosted Feature Layers and Voluntary Geographical Information. Story								

Maps and Configurable Applications. Web AppBuilder for ArcGIS. Publishing Map Services with ArcGIS for Server. Spatial Analysis and Geoprocessing Services. Mobile GIS and Real Time GIS. 3D (3D) Web Scenes.

Course Code	Course Name	T	P	L	ECTS	C	Hours	Type
CBS206	Mobile Geographic Information Systems	3	0	0	3	3	3	Compulsory

What is Mobile GIS? What are Mobile GIS Applications? Designing a web map for data generation in mobile GIS. Personel Mobile GIS (Data Generation), Enterprise Mobile GIS (data generation). Story Maps with Mobile GIS. Introduction to Application Design in Mobile GIS. Application Design in Mobile GIS.

Course Code	Course Name	T	P	L	ECTS	C	Hours	Type
CBS208	Geographic Information Systems Project	4	0	0	5	4	4	Compulsory

Select of project subject and area. Supply and digitization of data. Processing the data in a GIS software. Integration of semanthic data and establishment of tabular relations. Analysis of the data. Creation and presentation of project final products. Project presentations.

Course Code	Course Name	T	P	L	ECTS	C	Hours	Type
CBS210	Geographic Information Systems Application in Private Sector	3	0	0	3	3	3	Compulsory

Explaining the content and method of the course. Private Companies and Projects.

Course Code	Course Name	T	P	L	ECTS	C	Hours	Type
CBS212	Spatial Analysis in Geographic Information Systems II	2	2	0	5	3	4	Compulsory

ArcGIS Network Analysis Extension and Capabilities. Creating Network Dataset. Creating a Multimodal Network Dataset. Optimal Route Analysis Using Network Dataset. Nearest Facility Analysis. Service Area Determination and Cost Matrix Generation. Designing a Model for Route Analysis. Customer Demands and Fleet Management. Finding the Best Way for Health Care and Managing Vehicles. Optimum Store Locating. Live Traffic Data Arrangements and Usage on Network Dataset. Some Restriction Rules and Network Analysis. ArcGIS Geostatistical Analysis Extension and Capabilities.

Course Code	Course Name	T	P	L	ECTS	C	Hours	Type
CBS252	3D Modeling	2	1	0	3	3	3	Elective

Esri CityEngine User Interface. Project Management. Map Layers. Figures. Road Networks. Static Models. Rule Based Modeling. Data Import. Geographical Coordinating. Data Export. Attribute Mapping. Interactive Facade Arrangement. Web and 3D.

Course Code	Course Name	T	P	L	ECTS	C	Hours	Type
CBS254	Geographic Information Systems in Forestry Applications	2	1	0	3	3	3	Elective

Preparation of Forest Maps. Forest Database Design. Drawing (Digitization) and Update Operations. Data Transformation Functions and Data Transfer. Questioning and Reporting of Geographical Data. Using Time Information. Building the Infrastructure for Spatial Analysis. Determination of Potential Fire Areas. 3-dimensional image acquisition. Geographical Processing Tools in Forest Engineering. Data Transfer to ArcGIS Explorer and Google Earth. Network Analysis in Forest Engineering. Hydrology, LIDAR and NDVI Applications in Forest Engineering.

Course Code	Course Name	T	P	L	ECTS	C	Hours	Type
CBS256	Programming with Geographic Information Systems	2	1	0	3	3	3	Elective

Running scripts in Python. Describing data. Automating scripts with lists. Working with selections. Working with cursors. Working with geometry objects. Sharing scripts. Debugging scripts and handling runtime errors. Automating map production. Add-in logic with ArcGIS for Desktop. Program development, desktop add-in, program development climate, desktop add-in creation. ArcObject API and Using Visual Studio. Interactive interaction with maps, image exchange, data queries, combo box, add-in deployment, add-in security, code integrity.

Course Code	Course Name	T	P	L	ECTS	C	Hours	Type
CBS258	Drone (UAV) Technology	3	0	0	3	3	3	Elective

Explaining the content and method of the course. History and historical development of UAVs. Introduction of UAV types. Aircraft, flight dynamics and flight principles. Air law and responsibilities. Meteorological Information. ATC Procedures. Aviation freiology. UAV structural components and aerodynamics. Gimbal and useful load (camera etc.) docking. Navigation and Operation. Controllable systems and propulsion systems. Warnings, Precautions, Preparations, Arrangements and Appliances.