DTI-STU-102

Geographical Information System (GIS)

Program Information

GIS Beginners: Level 1

Nature of the Course
Theory + Practical

Total Hours per Day
2 hours

Course Duration
3 Weeks

Course Summary

The DTC – GIS course is targeted for beginners who want to learn how to think and write meaningful pieces of codes or read GIS codes written by someone else. This course teaches how to map literary description of a problem (requirement) to an application/library coded in GIS. This is a core basic level course that is essential for anyone who has no prior programming experience but wishes to be a professional GIS engineer in future.

Course Summary

After fulfilling all of the following criteria, the student will be deemed to have finished the module:
- Has attended 90% of all classes held.
- Has received an average grade of 80% on all assignments
- Has received an average of 60% in all assessments.
- The tutor believes the student has grasped all of the concepts and is ready to go on to the next module.

Required Textbooks

- Alexander Loth, "Visual Analytics with Tableau" Wiley.
- Ryan Sleeper, "Practical Tableau", O'Reilly Media.
- Molly Monsey and Paul Sochan, "Tableau for Dummies", Wiley.

Prerequisites

- Fundamental understanding of programming, bits/bytes, procedures, classes, and computer architecture. It's absolutely acceptable if you only have a theoretical understanding of programming, but you should be certain about what programming is and what you intend to gain from this session.
- If you are only interested in theory and have no interest/patience in spending at least 10 hours every week throughout the duration of the course, then this course might not be for you.
- If you have absolutely no idea about programming or do not see yourself doing programming in the next six -odd months, then this class may not be for you

Course Details

Course 1

Geographical Information System

- Definition
- Functional Component
- Application

Course 2

Remote Sensing (Rs)

- Principle
- Technology
- Application

Course 2

Global Positioning System (Gps)

Basic Components Of Map

- Elements
- Layers
- Scale and Representation
- Coordinate System
- Projection System
- Datum

📅 Week 2

Fundamental on Google Earth Pro

- Introduction
- Create My Places
- Save Place (KML/KMZ)
- Save Image (JPEG)
- Layers

Introduction to Esri And Arcgis

- ESRI
- GIS Architecture

Introduction to Arc Map

- Customize
- Adding Data (Layer)
- Shape File
- MDB
- GDB
- Image (Tif, Jpeg)
- Basic Tools
- Understanding Layers
- Check/Uncheck Zoom to Layer
- Field
- Edit Data
- Label Features
- Properties
- General
- Unit
- Data Frame
- Map Scale
- Coordinate System
- Layers Properties
- Data Source
- Symbology
- Fields
- Definition Query
- Select by Attribute
- Select by Location
- Labels
- Export Data (.shp)
- Map Scale
- Editor
- Map Template (Layout)
- Save Project File (.mxd)

📅 Week 3

Course 1

Coordinate System

- UTM
- WGS1984
- Grid System of Cadastral Survey of Nepal
- Everest_Adj_1937_Transverse_Mercator
- Calculation of x-y in Attribute Table
- Coordinate Transformation

Course 2

Geo-Referencing Raster

- Google Map
- Top Map
- Cadastral Map of Nepal (Grid Sheet)
- Cadastral Map of Nepal (Free Sheet)

Course 3

Design Files And Database (Using Arccatalog)

- Shape (.shp) file
- File Geodatabase (.gdb)
- Personal Geodatabase (.mdb)

Course 4

Digitizing (Vector Data)

- Point Feature
- Line Feature
- Polygon Feature

Course 5

Adding Data In Layer Feature Of Arcmap

- Google Map Data (KML)
- GPS Data (GPX)
- Total Station Data (CSV)
- Excel Sheet Data (XLS)

Course 6

Data Conversion

- KML -Layer - KML
- CAD - Layer - CAD
- GPX – Layer

Course 7

Editing Layer Features

- Design Map Layout
- Title, Body, Inset, Scale, North Arrow, Legends
- Page and Print Set Up

Labs

Lab assignments will focus on the practice and mastery of contents covered in the lectures, and introduce critical and fundamental problem solving techniques to the students.

Program Information

Intermediate GIS: Level 2

Nature of the Course
Theory + Practical

Total Hours per Day
2 hours

Course Duration
2 Weeks

Course Summary

The DTC – GIS – Level 2 course is designed for students who have some prior hands-on programming experience with the GIS programming language at a beginning level. This course is ideal for people who have previously programmed in another programming language (e.g., Java, Obj-C, PHP, C, C++, etc.) and wish to learn GIS. This course is designed for high school and university students who want to do GIS coursework, including those who are already working as a professional VB.NET developer and want to switch to GIS, as well as those who have worked in the media industry since graduation or are working as a professional freelance PHP developer

Completion Criteria

After fulfilling all of the following criteria, the student will be deemed to have finished the module:

- Has attended 90% of all classes held.
- Has received an average grade of 80% on all assignments
- Has received an average of 60% in all assessments.
- The tutor believes the student has grasped all of the concepts and is ready to go on to the next module.

Required Textbooks

- Eric Pimpler, "ArcGIS Blueprints", Packt.
- Tripp Corbin, "Learning ArcGIS Pro 2", Packt.
- Jonathan Campbell and Michael Shin, "Essentials of Geographic
- Information Systems", Saylor Foundation.

Prerequisites

- Basic knowledge about programming, bits/bytes, procedures, classes, computer architecture, etc. If you just have theoretical knowledge that is perfectly okay but you should have strong convictions on what 1 programming is, and what you hope to achieve from this class.
- Willing and eager to spend at least 10-20 hours (varying from student-to-student) per week outside of the training class to read/write codes in JavaScript (self-study and practice).
- There is no prior educational level requirement for this course. Anyone from 10+2 student to someone who is doing her PHD in Genetic Engineering is welcome to take this course.
- If you are only interested in theory and have no interest/patience in spending at least 10 hours every week throughout the duration of the course, then this course might not be for you.
- If you have absolutely no idea about programming or do not see yourself doing programming in the next six - odd months, then this class may not be for you.

Course Details

📅 **Week 1**

`Course 1`

Analysis

- Extract
- Overlay
- Proximity
- Statistics

`Course 2`

Network Analysis

- Creating Network Data
- Finding Best Possible Routes
- Finding Closest Facility

`Course 2`

Spatial Analyst

- Interpolation
- Extraction

📅 Week 2

Course 1

Image Classification

- Interactive Supervised
- Unsupervised

Course 2

Data Management

- Topology

Course 3

Archydro

- Watershed Analysis
- Create Contour Line

Labs

Lab assignments will focus on the practice and mastery of contents covered in the lectures, and introduce critical and fundamental problem solving techniques to the students.

Program Information

Advanced GIS: Level 3

Nature of the Course
Theory + Practical

Total Hours per Day
2 hours

Course Duration
2 Weeks

Course Summary

This course expands on the DTC – GIS – Level 2 foundation and offers advanced subjects to equip learners for a career as a GIS software engineer.

Completion Criteria

After fulfilling all of the following criteria, the student will be deemed to have finished the module:
- Has attended 90% of all classes held.
- Has received an average grade of 80% on all assignments
- Has received an average of 60% in all assessments.
- The tutor believes the student has grasped all of the concepts and is ready to go on to the next module.

Required Textbooks

- Maribeth Price, "Mastering ArcGIS", McGraw Hill.

Prerequisites

- Successfully completed the DWIT Training – GIS – Level 2 or obtained at least 40% score on the entrance exam.
- The latter case applies for new students that are directly attempting this training.
- Successfully complete the interview.
- Willing and eager to spend at least 10-20 hours (varying from student-to-student) per week outside of the training class to read/write codes in GIS (self-study and practice).
- Please note that this is a lab intensive course where the students will be expected to work on lab exercises for approximately half the duration of the session.

Course Details

APPROACH TO WEB GIS

Labs

Lab assignments will focus on the practice and mastery of contents covered in the lectures, and introduce critical and fundamental problem solving techniques to the students.

Learning Outcomes

- Explore mapped data
- Relate GIS with remote sensing technologies
- Analyze spatial data, using GIS analysis tools
- Develop and manage geodatabases
- Apply Python as a GIS computer language
- Create maps, images and apps to communicate spatial data in a meaningful way to others