



<b>GIS: LEVEL 1</b> .....	<b>2</b>
OBJECTIVES .....	2
TARGET GROUP.....	2
TRAINING METHOD.....	3
COURSE DURATION.....	3
COURSE BREAKDOWN .....	3
<b>GIS : LEVEL2</b> .....	<b>7</b>
OBJECTIVES .....	7
TARGET GROUP.....	7
TRAINING METHOD.....	8
COURSE DURATION.....	8
<b>GIS : LEVEL 3</b> .....	<b>10</b>
OBJECTIVES .....	10
TARGET GROUP.....	10
TRAINING METHOD.....	10
COURSE DURATION.....	11
COURSE BREAKDOWN .....	11



## GIS: LEVEL 1

### OBJECTIVES

The DWIT Training - GIS course is targeted for beginners who want to:

- Learn how to think and write meaningful piece of code in GIS.
- Learn how to read GIScode that has been written by somebody else.
- Learn how to map literary description of a problem (requirement) to an application/library coded in GIS. In summary, this course teaches how to program using GIS programming language.

This is a core basic level course that is essential for anyone who have no prior programming experience but wish to be a professional GIS engineer in future

### TARGET GROUP

Anyone who has some basic knowledge about programming and wants to learn to write applications in GIS for any purpose e.g. curiosity, hobby, to complete an academic project, to work towards a career as GIS programmer, to help in project management, etc.

#### Prerequisites

- Basic knowledge about programming, bits/bytes, procedures, classes, computer architecture, etc. If you just have a theoretical knowledge that is perfectly okay but you should have strong convictions on what 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 GIS (self-study and practice).
- There are 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 is clearly not 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!



## TRAINING METHOD

The course is spread over 40 hours that consists of lecture and lab work. There will be approximately 10 hours of lectures and 30 hours of hands-on lab work.

- Lab exercises are mandatory, have a fixed deadline, and are graded. The course puts heavy emphasis on lab exercises because software programming can only be learnt well by explicitly putting into practice the principles that have been taught (i.e. in simpler terms – by doing lots and lots of coding). Late submission (past the deadline) of exercises incur some penalty from total points.
- Instructors may provide relevant lecture/lab notes to students as (and when) necessary in the form of printed handouts and or via emails.
- Instructors may provide supplementary code snippets to students via email or in lab class to support the theory and or lab material that is being taught.
- At the end of the course, students may have to give an exam (which will be optional), that will test their knowledge on the material covered during the course. This exam may be practical and/or theoretical and is mandatory for any student wishing to join a higher level.
- Students are graded on the basis of attendance, lab exercises and exam in the increasing order of importance.

In summary, the only effective way to learn programming is to write lots of code. So in order to really make this training productive, students are encouraged to spend as much time as necessary to complete the lab exercises on time. As part of the course, students will spend at least 30 hours in the lab but specially if you are new to programming or are coming from a non-computer-science background, it is recommended that you spend at least 10-20 hours per week outside of the class on your own to practice coding in GIS.

## COURSE DURATION

- 30 hours
- Classes  
-Morning/Evening

## COURSE BREAKDOWN

### Theory

- **GEOGRAPHICAL INFORMATION SYSTEM**
  - Definition
  - functional Component
  - Application



- **REMOTE SENSING (RS)**
  - Principle
  - Technology
  - Application
  
- **GLOBAL POSITIONING SYSTEM (GPS)**
  
- **BASIC COMPONENTS OF MAP**
  - Elements
  - Layers
  - Scale and Representation
  - Coordinate System
  - Projection System
  - Datum
  
- **FUNDAMENTAL OF 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
  - Attribute Table
  - 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)
- **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
- **GEO-REFERENCING RASTER**
    - Google Map
    - Top Map
    - Cadastral Map of Nepal (Grid Sheet)
    - Cadastral Map of Nepal (Free Sheet)
- **DESIGN FILES AND DATABASE (USING ARCCATALOGUE)**
    - Shape (.shp) file
    - File Geodatabase (.gdb)
    - Personal Geodatabase (.mdb)
- **DIGITIZING (VECTOR DATA)**
    - Point Feature
    - Line Feature
    - Polygon Feature
- **ADDING DATA IN LAYER FEATURE OF ARCMAP)**
    - Google Map Data (KML)
    - GPS Data (GPX)
    - Total Station Data (CSV)
    - Excel Sheet Data (XLS)
- **DATA CONVERSION**
    - KML -Layer - KML
    - CAD - Layer - CAD
    - GPX – Layer



- **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.

### **DISCLAIMER**

Please note that Deerwalk Institute of Technology reserves the right to change the course syllabus of DWIT Training - GIS – Level 1 course at any time without prior notification.



## GIS : LEVEL2

### OBJECTIVES

The DWIT Training - GIS – Level 2 course is targeted for trainees:

- Who have had some prior beginner level hands-on programming experience in GIS programming language.
- Who have programming experience in some other programming language (e.g. GIS, Obj-C, PHP, C, C++, etc.) and want to learn GIS .

### TARGET GROUP

- High school and university students (undergraduate, graduate, etc.) who want to do coursework (e.g. project, etc.) in GIS.
- Someone who has experience in some other programming language (e.g. C/C++, PHP, Perl, etc.), but has never done programming in ANDROID.
- Someone who is already working as a professional VB.NET developer and wants to switch to ANDROID.
- Someone who did her undergraduate in Economics, has been working in Media sector since graduation, and also working as a professional freelance PHP developer.
- Electrical/Electronic undergraduates in their 3rd semester who want to beef up their software skills prior to graduation.

### Prerequisites

- Successfully complete the entrance test with score of at least 40% (for trainees directly applying to this level).
- Successfully complete the DWIT Training - GIS – Level 1 course (not applicable to trainees directly applying to this level).
- Successfully complete the interview.
- o 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).



## TRAINING METHOD

The course is spread over 40 hours that consists of approximately 15 hours of lecture and 25 hours of hands-on lab work.

- Lab exercises are mandatory, have a fixed deadline, and are graded. The course puts heavy emphasis on lab exercises because software programming can only be learnt well by explicitly putting into practice the principles that have been taught (i.e. in simpler terms – by doing lots and lots of coding). Late submission (past the deadline) of exercises incur some penalty from total points.
- Instructors may provide relevant lecture/lab notes to students as (and when) necessary in the form of printed handouts and or via emails.
- Instructors may provide supplementary code snippets to students via email or in lab class to support the theory and or lab material that is being taught.
- At the end of the course, students may have to give an exam (which will be optional), that will test their knowledge on the material covered during the course. This exam may be practical and/or theoretical and is mandatory for any student wishing to join a higher level.
- Students are graded on the basis of attendance, lab exercises and exam in the increasing order of importance.

In summary, the only effective way to learn programming is to write lots of code. So in order to really make this training productive, students are encouraged to spend as much time as necessary to complete the lab exercises on time. As part of the course, students will spend at least 30 hours in the lab but specially if you are new to programming or are coming from a non-computer-science background, it is recommended that you spend at least 10-20 hours per week outside of the class on your own to practice coding in GIS.

## COURSE DURATION

- 20 hours
- Classes
  - Morning/Evening





- **ANALYSIS**
  - Extract
  - Overlay
  - Proximity
  - Statistics
  
- **NETWORK ANALYSIS**
  - Creating Network Data
  - Finding Best Possible Routes
  - Finding Closest Facility
- **SPATIAL ANALYST**
  - Interpolation
  - Extraction
  
- **SPATIAL ADJUSTMENT**
  
- **IMAGE CLASSIFICATION**
  - Interactive Supervised
  - Unsupervised
- **DATA MANAGEMENT**
  - Topology
  
- **ARCHYDRO**
  - Watershed Analysis
  - Create Contour Line
  - Create DEM
  
- **3D ANALYSIS/DATA MANAGEMENT**
  - Crating TIN

#### **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.

#### **DISCLAIMER**

Please note that Deerwalk Institute of Technology reserves the right to change the course syllabus of DWIT Training - GIS – Level 2 course at any time without prior notification.



## GIS : LEVEL 3

### OBJECTIVES

This course builds on the foundation laid by DWIT Training - GIS – Level 3 to prepare trainees for a career as GIS software engineer.

### TARGET GROUP

#### Prerequisites

- Successfully completed the DWIT Training - GIS – Level 3 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.

### TRAINING METHOD

- The course is spread over 40 hours that consists of approximately 20 hours of lecture and 20 hours of lab work.
- Lab exercises are mandatory, have a fixed deadline, and are graded. The course puts heavy emphasis on lab exercises because software programming can only be learnt well by explicitly putting into practice the principles that have been taught (i.e. in simpler terms – by doing lots and lots of coding). Late submission (past the deadline) of exercises incur some penalty from total points.
- Instructors may provide relevant lecture/lab notes to students as (and when) necessary in the form of printed handouts and or via emails.



- Instructors may provide supplementary code snippets to students via email or in lab class to support the theory and or lab material that is being taught.
- At the end of the course, students may have to give an exam (which will be optional), that will test their knowledge on the material covered during the course. This exam may be practical and/or theoretical and is mandatory for any student wishing to join a higher level.
- Students are graded on the basis of attendance, lab exercises and exam in the increasing order of importance.

## COURSE DURATION

- 10 hours
- Classes  
-Morning/Evening

## COURSE BREAKDOWN

- **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.

### DISCLAIMER

Please note that Deerwalk Institute of Technology reserves the right to change the course syllabus of DWIT Training - GIS – Level 2 course at any time without prior notification.