

## **Course Outline**

### **1 Course Information**

**Course Name: Survey Practice**

**Course Code: GeGo 5104**

**Credit Hour: 6 ECTS**

**Program: MSc in Geodesy and Geomatics**

**Semester: Year I, II Semester, 2020**

**Academic Year: 2019/2020**

**Instructor: Tulu Besha, PhD, [tulubesha@yahoo.com](mailto:tulubesha@yahoo.com) / Andenet A.**

### **2 Course Description**

*Survey planning, familiarization with instrumentation, data collection techniques, and an explanation of downloading and post-processing of collected data; introduction to LINUX/UNIX command-line operating system with practical exercise on Datum, coordinate systems and visualization; GPS survey: differential static GPS measurements, Real-Time Kinematic (RTK) measurements; GNSS satellite orbits, sky plot, GNSS ephemerides to ECEF positions, manipulating GNSS data, GNSS data quality control, from pseudoranges to position, Processing of a 24 hours RINEX observation file: Using GAMIT/GLOBK and other selected commercial GNSS data processing software levelling, triangulation, geodetic total station, gravity, techniques of geodetic monumentation and station establishment*

### **3 Course Objectives**

At the end of the course students will be able to

- Plan and execute survey projects
- Understand the principles of survey instruments and measurement techniques
- Understand survey data processing and computations

### **4 Contents for Lecturing**

Chapter 1: Surveying Instruments and Planning

1.1 Survey Instrument

1.2 Surveying project planning

Chapter 2: Data Collection Techniques

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2.1 Leveling

2.2 Theodolite Surveying

2.3 Total Stations Surveying

2.4 GNSS Surveying

2.5 Laser Scanning Surveying

2.6 Gravity Surveying

Chapter 3: Surveying Data Processing

3.1 Surveying Data Downloading

3.2 Surveying Data Processing

3.3 Surveying Data Adjustment

## 5 Survey Field Practice Tasks

Task 1 – Introduction to Survey Instrument

Task 2 – Level measurement and adjustment

Task 3 – Closed traversing measurement and adjustments

Task 4 – Link traverse measurement and adjustments

Task 5 – Trigonometric leveling

Task 6 – GPS measurements and data processing using Leica Geo Office and GAMIT/GLOBK (Linux)

Task 7 – Setting out Survey

## 6 Assessment

Field Practice Continuous assessments	30%
Reports	40%
Final Exam	30%

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## 7 Reference

Ogundare, J. O. (2019) Understanding least squares estimation and geomatics data analysis, John Wiley & Sons

Schofield W., Breach M. (2007) Engineering Surveying, Sixth Edition, ELSEVIER.

Wolf, P. R. and Ghilani, C. D. (2012), Elementary Surveying: An introduction to Geomatics, 13th ed, Prentice Hall.

Uren, J. and Price, W.F. (2005), Surveying for Engineers, 4th edition, Palgrave Macmillan.