Co-funded by the Erasmus+ Programme of the European Union

Souphanouvong University No _____/.....

Place, Date ____/___/___

# Course Syllabus

## 1 Program

Title of the study programme: **Bachelor of Science in Forest Resources**

## 2 Course details

Course name: Geographic Information System

Course code: 103 2212

Number of credits (hours/week): 3 (2-3-4); 4 hours per week, two classes per week. Total 144 hours: 32 hours Lectures, practice 48 hours, and assignment 64 hours.

Course type (tick the appropriate box): ☒ Required, ☐ Elective, ☐ Other, if other please explain:

Prerequisites courses: Basic Computer

Semester, in which the course is taught: *tick the appropriate box below*

| Year 1 | | Year 2 | |
|---|---|---|---|
| **Semester 1** | **Semester 2** | **Semester 1** | **Semester 2** |
| ☐ | ☐ | ☒ | ☐ |

## 3 Responsible unit

### 3.1 Department:

Names and affiliations of lecturer(s):

**Lecturer**: Anoukone MANYVONG. **Affiliation**: Department of Forest Resource, Faculty of Agriculture and Forest Resource. Souphanouvong University.

# 4 Course description

This course is to introduce basic knowledge about technology in GPS (Geographic Position System), Remote Sensing (RS), and Geographic Information System (GIS) applications. The course purpose increasing students' capacity for expanding knowledge of landscape data analysis in terms of information features of GIS including (Spatial Data, Attribute Data), Spatial data features (Raster, Vector), and understanding and using tools and basic software for mapping and remote sensing. Students will gain the skills to create maps and apply basic analysis using QGIS software specifically.

# 5 Course objectives

*Students should be able to use GIS equipment, data collection, survey data, data analysis and the drawing of land and forest maps for use in planning and management activities.*

**Knowledge**: Students know the basics of geographic information, satellite imagery analysis, mapping, and ArcMap software knowledge as well as Google Earth, GPS, and drone use.

**Skills**:

- Students can create maps, calculate areas, and use geographic applications and devices.

**Application of theories to practice:**

- All students are able to use knowledge of applications and tools to draw and analyze data

**Social knowledge and skills:**

- All postgraduate students will have skills for working with a team, team leader to do projects, to be good work with coordination.

## 5.1 Learning objectives of particular modules

*If the course is divided into sections or modules, please state the learning objectives for the specific sections/modules taught within the course*

# 6 Course teaching methods

This course will employ mixed approaches for teaching including lectures, practices, and group discussions.

## 7 Teaching plan

| Week | Content | Method/activity | Hours |
|---|---|---|---|
| 1 | **Chapter 1: Introduction to Geographic Information System**<br>1. Background of GIS<br>2. Related technologies (RS, GPS, GIS) | - Lecture<br>- Q&A<br>- Discussion | **8** |
| **2** | **Chapter** 1: **Introduction to Geographic Information System (continue)**<br>**1.** The purpose and importance of GIS<br>**2.** Components of GIS (Data, hardware, software, user, process) | **-** Lecture<br>**-** Q&A<br>**-** discussion<br>- Assignment | **8** |
| **3** | **Chapter 2: Information features in geographic information systems**<br>1. Information in GIS<br>1.1. Spatial Data<br>1.2. Attribute Data | - Lecture<br>- Q&A<br>- Discussion | 8 |
| **4** | 2. Spatial data features<br>2.1. Raster<br>2.2. Vector<br>3. Overlay spatial data | - Lecture<br>- Q&A<br>- discussion<br>- Assignment | **8** |
| **5** | **Chapter 3: Using GPS**<br>1. The meaning of GPS<br>2. GPS function<br>3. GPS signal reception restrictions<br>- GPS Perform GPS usage | - Lecture<br>- Q&A<br>- Discussion<br>- Practice to use GPS | **8** |
| **6** | **Chapter** 4: **Using Map source software**<br>- Install the program<br>- Practice using Map source<br>- Load GPS data to a computer | - Lecture<br>- Q&A<br>- Practice to use Map source<br>- Make Group, discussion | **8** |
| **7** | **Chapter 5: Using Google Earth Pro and GPS applications**<br>- Install programs and applications<br>- Google Implement the Google Earth application | - Lecture<br>- Q&A<br>- Practice to use Google Earth pro<br>- Assignment | **8** |
| **8** | **Midterm exam** | | **4** |
| **9** | **Lesson 6: Introduction to drone use**<br>- Basic knowledge of drones<br>- Regulations on the use of drones in Lao PDR<br>- Applying for a drone license | - Lecture<br>- Q&A<br>- Discussion | **8** |

| | | | |
|---|---|---|---|
| 10 | **Chapter** 7: **Basics of using Qgis**<br>- Install QGIS<br>- Introduce the basic tools | - Lecture<br>- Q&A<br>- Practice to use QGIS<br>- Make Group, discussion | **8** |
| **11** | - Introduction to Basic Tools (Continued)<br>- Practice using QGIS | - Lecture<br>- Q&A<br>- Practice to use QGIS<br>- Make Group, discussion | **8** |
| **12** | - Practice using QGIS (continued)<br>- Practice analyzing satellite imagery | - Lecture<br>- Q&A<br>- Practice to use QGIS<br>- Make Group, discussion | **8** |
| **13** | - Practice using QGIS (continued)<br>- Import data from surveys, from GPS to analyze data and draw maps | - Lecture<br>- Q&A<br>- Practice to use QGIS | **8** |
| **14** | - Practice using QGIS (continued)<br>- Import data from surveys, from GPS to analyze data and draw maps | - Practice to use QGIS<br>- Assignment | **8** |
| **15** | - Organize groups to practice, write reports<br>- Collect field data at various places such as forest area within Suphanuvong University, plantation forest, natural forest, protected forest .... | - Make Group, discussion<br>- Select a location to collect data | **8** |
| **16** | - Import data, analyze data, draw maps<br>- export map<br>- Write a report | Q&A | **8** |
| **17** | - Defense and present the report | Presentation**,** Q&A | **8** |
| **18** | review all lesson prepare to final exam | Q&A | **8** |
| **19** | Final exam | | **4** |

## 8 Material needs

Computers, applications, GPS devices, smart phones, satellite imagery

## 9 References

### 9.1 Compulsory reading list

- Boonxian Phetlamphan, Hor Manithong, (2018) Geographic Information System Manual

### 9.2 Suggested reading list

- Assoc. Suphet Chirakhajonkun, (2017) Learn Geographic Information System ArcGIS 10.5, Thailand

- Vongsaphayangkoon Festival, (2009) Distance Recognition Guide, Department of Civil Engineering, Thammasat University, Thailand.

## 10. Assessment of students

### 10.1 Description of assessment

Course assessment for students' grades, will collect the score from several criteria: class participation 10%, Activities with Q&A 10%, Report 20%, Midterm 20%, and final term 40%.

10.2 Grade distribution and student assessment

**Grading scale**

| Grade | | Total score | Scale |
|---|---|---|---|
| **Symbol** | **Verbal grade** | | |
| A | Excellent | 90-100 | 4.00 |
| $B^+$ | Very Good | 85-89 | 3.5 |
| B | Good | 80-84 | 3.00 |
| C+ | Fairly Good | 75-79 | 2.50 |
| C | Fair | 70-74 | 2.00 |
| D+ | Poor | 65-69 | 1.50 |
| D | Very Poor | 60-64 | 1.00 |
| F | Fail | 59 | 0.00 |

*Place*, Date ...../...../.....