Course Syllabus

1. **Course Title:** Geodesic Survey
2. **Course Code:** SURV220119
3. **Credit Units:** 2(2/0/4) (2 units of theory/ 0 unit of practice/ 4 units of self-study)
   Duration: 10 weeks (3 hours of theory+0 hours of practice, and 6 hours of self-study per week)
4. **Course Instructors:**
   1. MSc. Nguyễn Văn Khoa
   2. MSc. Nguyễn Thị Ánh Tuyết
   3. MSc. Lương Xuân Cán
5. **Course Requirements:**
   Prerequisite courses: Non
   Previous courses: Non
   Parallel courses: Non
6. **Course Description**
   This subject provides following concepts for learners: reference surfaces of Geoids and Ellipsoid of the earth; way of ground manifestation by the map; geodesic errors in measurement; basic knowledge and tools in geodesic measurements (angle measurement, length measurement, and height measurement); control grid of coordinates and altitude; method of measuring and drawing the detailed maps and its cross-sections, ways of using map in construction design; and surveying and mapping work in the plans.
7. **Course Goals**

Goals	Goal Description	Programme ELOs
G1	Having the general knowledge of geodesy in order to measure, analyze, treating the data of terrain.	1.2
G2	Deal with factual problems in career through continuous development of technical and management skills, roles of responsibility in professional activities, and life-long learning ability.	2.1, 2.4, 2.5
G3	Adapt effectively in the professional environment, leadership and teamwork in the context of foundation engineering; use English in construction engineering, with the emphasis on reading and writing skills.	3.1, 3.3

8. **Course Learning Outcomes (CLOs)**

CLOs		CLO Description	Programme ELOs
G1	**G1.1**	Define the science of the earth, the terrain representation, the geodesic coordination, the error, the measurement methods, the control network, the topography map	1.2
G2	**G2.1**	Setting up the basic factors (angle, dimension, height) from the draw to the field; calculating the smooth volume of the field surface; locating the construction work; solving the problems in career.	2.1

	G2.2	Self-study and life-long learning ability.	2.4
	G2.3	Have a sense of responsibility, loyal in professional activities such as measurement and report.	2.5
G3	**G3.1**	Develop experience of collaborative group-working	3.1
	G3.2	Engage in reading geodesic materials in English	3.3

9. Learning Resources

- Textbooks:

[1] Nguyễn Tấn Lộc, **Trắc địa đại cương**, NXB ĐHQG 2002.

[2] W S Whyte, R E Paul **Basic Surveying** Fourth edition 1997

- References:

[3] Phạm Văn Chuyên, **Trắc địa đại cương,** NXB Xây Dựng 2010.

[4] Phạm Văn Chuyên, **Hướng dẫn trả lời câu hỏi và giải bài tập trắc địa**, NXB Xây Dựng 2011.

[5] Vũ Thặng, **Trắc địa xây dựng**, NXB Khoa Học và Kỹ Thuật 2005.

[6] Vũ Thặng, **Trắc địa xây dựng thực hành,** NXB Xây Dựng 2002.

10. Student Assessment:

- Grading scale: **10**
- Assessment plan:

Type	Content	Timeline	Assessment method	CLOs	Rate (%)
Assignment					**20**
Problem#1	Chapter 1 - Chapter 2 – Chapter 3	Week 4	Quiz	G1.2, G2.2	5
Problem #2	Chapter 4 - Chapter 5 - Chapter 6	Week 5	Quiz	G2.2, G3.2	5
Problem #3	Chapter 7	Week 7	Quiz	G2.2 G2.3	5
Problem #4	Chapter 8	Week 8	Quiz	G2.1, G2.2	5
Group working					**10**
	Assignments and discusion	Week 4 - 10		G3.1	
Formative examination					**20**
	Contents in Chapter 1 - 7	Week 8	Multiple choice test	G1.2, G2.2, G3.2	20
Final examination					**50**
	Content coverage: Chapter 1-8 - Duration: 75 mins		Writing (50%) + multiple	G1.2, G2.1, G3.2	

			choice (50%) exam	G3.3	

11. Course Content:

Week	Content	CLOs
1	***Chapter 0: Overview of geodesy*** *(1h/0/2h)*	
	A/ Content and pedagogical methods in class: (1h) **Content:** Introduction the course's goals, CLOs, content, pedagogical and assessment methods 1.1 + Introduction to geodesic engineering 1.2 + Geodesic roles in civil engineering 1.3 + Course introduction, syllabus 1.3.1 Expected learning outcomes (ELOs) 1.3.2 Programme specification 1.3.3 Programme structure and content **Pedagogical methods**: + Presentation of lecture	G1.2
1 + 2	***Chapter 1: The Earth & Its mathematical representation*** *(5h/0/10h)*	
	A/ Content and pedagogical methods in class: (5h) **Content:** 1.4 ***Location of a point*** + Concepts of Geoid and Ellipsoid + Concepts of Geographical Coordinate System, Geodesic Coordinate System, Perpendicular Coordinate System + Concepts of altitude, variance of height, Altitude System ***1.5 Orientation of a line*** + The concept of the orientation angle + Problem of orientation angle + Riversible problem **Pedagogical methods**: + Presentation of lecture	G1.2
	B/ Self-study content: *(10h)* + GPS + Compass direction + Answer questions and exercises of Chapter 1 ***Studying materials*** [1], [2], [3], [4], [5], [6]	G2.2
3	***Chapter 2: Topographical map*** *(3h/0/6h)*	

	A/ Content and pedagogical methods in class: (3h) **Content:** + Concepts of map, plan map and sections + Usage of map **Pedagogical methods**: + Presentation of lecture	G1.2, G2.2
	B/ Self-study content: *(6h)* + Topographical performance + GIS + Setting sections and cross-sections + Answer questions and exercises of Chapter 2 ***Studying materials*** [1], [2], [3], [4], [5], [6]	G1.2, G2.2
4	***Chapter 3: Surveing error*** *(3h/0/6h)*	
	A/ Content and pedagogical methods in class: (3h) **Content:** + Concept of measurement in survey + Concep of surveying error + Evaluation of accuracy of surveying data **Pedagogical methods**: + Presentation of lecture	G1.2, G2.2
	B/ Self-study content: *(6h)* + Evaluation of accuracy of surveying data (cont.) + Answer questions and exercises of Chapter 3 ***Studying materials*** [1], [2], [3], [4], [5], [6]	G1.2, G2.2
	Chapter 4: Angular measurement *(2h/0/4h)*	
5	***A/ Content and pedagogical methods in class: (2h)*** **Content:** + Concepts of kind of angulars + Design of theodolite + Methods of angular measurement **Pedagogical methods**: + Presentation of lecture	G1.2, G2.2, G2.5, G3.2
	B/ Self-study content: *(4h)* + Design of electronic theodolite and how to use + Answer questions and exercises of Chapter 4 ***Studying materials*** [1], [2], [3], [4], [5], [6]	G1.2, G3.2
5 + 6	***Chapter 5: Distance measurement*** *(2h/0/4h)*	

	A/ Content and pedagogical methods in class: (2h) **Content:** + Principle of distance measurement + Methods of distance measurement **Pedagogical methods**: + Presentation of lecture	G1.2, G2.2, G2.5, G3.2
	B/ Self-study content: *(4h)* + Answer questions and exercises of Chapter 5 ***Studying materials*** [1], [2], [3], [4], [5], [6]	G1.2, G3.2
6	***Chapter 6: Height measurement*** *(2/0/4)*	
	A/ Content and pedagogical methods in class: (2h) **Content:** + Principle of height measurement. + Design of level. + Methods of height measurement. **Pedagogical methods**: + Presentation of lecture	G1.2, G2.2, G2.5, G3.2
	B/ Self-study content: *(4h)* + Answer questions and exercises of Chapter 6 ***Studying materials*** [1], [2], [3], [4], [5], [6]	G1.2, G3.2
7 + 8	***Chapter 7: Control network*** *(6/0/12)*	
	A/ Content and pedagogical methods in class: (3h) **Content:** + Concept of control network + Concept of adjustment + Steps of technical coordinates control network construction + Adjustment of technical coordinates control network + Adjustment of technical heights control network **Pedagogical methods**: + Presentation of lecture	G1.2, G2.2, G2.3
	B/ Self-study content: *(6h)* + Answer questions and exercises of Chapter 7 ***Studying materials*** [1], [2], [3], [4], [5], [6]	G1.2, G3.1
	Chapter 8: Survey on construction project *(6/0/12)*	G1.2, G3.1, G 3.2
	A/ Content and pedagogical methods in class: (3h) **Content:** + Overview of setting out	

9+10	+ Methods of setting out + Survey the deformation of construction projects **Pedagogical methods**: + Presentation of lecture	
	B/ Self-study content: *(6h)* + Answer questions and exercises of Chapter 8 ***Studying materials*** [1], [2], [3], [4], [5], [6]	G1.2, G3.1

12. Learning Ethics:

Students must do homework by themselves. If plagiarism is found students will get zero point.

13. Date of first approval: August 1st, 2012

14. Approved by:

Dean	**Head of Department**	**Instructor**
A/Prof.Dr. Nguyễn Trung Kiên	**MSc. Nguyễn Văn Khoa**	**MSc. Nguyễn Thị Ánh Tuyết**

15. Date and Up-to-date content

1st time: Date/Month/Year	Instructor: Head of Department: