

Course Code	Course Name	Teorical	Practice	Laboratory	Credits	ECTS
GE413	PHYSICAL GEODESY	3.00	0.00	0.00	4.00	4.00
Course Detail						
<b>Course Language</b>	: English					
<b>Qualification Degree</b>	: Bachelor					
<b>Course Type</b>	: Optional					
<b>Preconditions</b>	: Not					
<b>Objectives of the Course</b>	: Real figure of the Earth, geoid, cannot be expressed by an implicit function. Due to computational simplicity rotational ellipsoid is adapted both geometrically and physically as the real figure of the Earth. Measurements are in practice reduced to this "normal" shape for horizontal positioning. However, one needs supplementary measurements like gravity or pre-calculated products like geoidal height for reducing observations and for use in specific infrastructure projects. This course will deliver students how to compute the real figure of the Earth for local and global applications.					
<b>Course Contents</b>	: Potential theory, Earth's gravity field, gravity reductions, height and height systems, Earth's geometrical shape, satellite methods, applications.					
<b>Recommended or Required Reading</b>	: 1. Hofmann-Wellenhof, B., Moritz, H. (2006). Physical geodesy, Second corrected edition, Springer, Wien 2. Torge, W. (2012) Geodesy, 4th edition Walter de Gruyter, Berlin. 3. Abbak, RA. (2021) Fiziksel Jeodezi, Genişletilmiş 4. baskı, Atlas Akademi, Ankara.					
<b>Planned Learning Activities and Teaching Methods</b>	: Lectures with discussions.					
<b>Recommended Optional Programme Components</b>	: Advanced level physics and mathematics knowledge.					
<b>Instructors</b>	: Dr. Öğr. Üyesi Nevin Betül Avşar					
<b>Instructor's Assistants</b>	: NA					
<b>Presentation Of Course</b>	: Slides, visual materials					
<b>En Son Güncelleme Tarihi:</b>	: 2/19/2024 4:06:08 PM					

## Course Outcomes

## Upon the completion of this course a student :

- 1 Define potential and discuss its necessity for physical geodesy.
- 2 Express Earth's mass attraction by series expansion.
- 3 Differentiate among gravity, normal and disturbing potential.
- 4 Define the boundary value problems in physical geodesy.
- 5 Give relation between geometric and orthometric height.

## Preconditions

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Weekly Contents						
	Teorical	Practice	Laboratory	Preparation Info	Teaching Methods	Course Learning Outcomes
1.Week	*Introduction.					Ö.Ç.1 Ö.Ç.2 Ö.Ç.3 Ö.Ç.4 Ö.Ç.5
2.Week	*Basics of the Potential Theory					Ö.Ç.1
3.Week	*Gravitational force, gravitational acceleration and gravitational potential. Laplace differential equation. Harmonic functions.					Ö.Ç.2
4.Week	*Expansion of the gravitational potantial. Legendre functions.					Ö.Ç.2
5.Week	*Global Geopotential Models.					Ö.Ç.2
6.Week	*Centrifugal force. Gravity force. Gravity field of the Earth.					Ö.Ç.3
7.Week	*Gravity field of the Earth. Natural coordinates.					Ö.Ç.3
8.Week					*Midterm exam.	Ö.Ç.1 Ö.Ç.2 Ö.Ç.3
9.Week	*Height Systems					Ö.Ç.5
10.Week	*Ellipsoid and Normal Gravity Field.					Ö.Ç.3
11.Week	*Disturbing gravity field and the related values.					Ö.Ç.3
12.Week	*Geoid determination.					Ö.Ç.4
13.Week	*Geoid determination.					Ö.Ç.4
14.Week					*Numerical Examples.	Ö.Ç.1 Ö.Ç.2 Ö.Ç.3 Ö.Ç.4 Ö.Ç.5
15.Week					*Final Exam.	Ö.Ç.1 Ö.Ç.2 Ö.Ç.3 Ö.Ç.4 Ö.Ç.5

Assesment Methods %
1 Mdters : 40.000
2 Final : 60.000

ECTS Workload			
Activities	Count	Time(Hour)	Sum of Workload
Derse Katılım / Attending lectures	14	3.00	42.00
Ders Öncesi Biresysel Çalışma / Individual study before lecture	14	3.00	42.00
Ders Sonrası Biresysel Çalışma / Individual study after lecture	14	1.00	14.00
Ara Sınav Hazırlık / Preparation for midterm	1	10.00	10.00
Final Sınavı Hazırlık / Preparation for final	1	10.00	10.00
Vize / Midterms	1	2.00	2.00
Final / Final	1	2.00	2.00
			Total : 122.00
			Sum of Workload / 30 ( Hour ) : 4
			ECTS : 4.00

Program And OutcomeRelation											
	P.O. 1	P.O. 2	P.O. 3	P.O. 4	P.O. 5	P.O. 6	P.O. 7	P.O. 8	P.O. 9	P.O. 10	P.O. 11
L.O. 1	5	4	0	4	0	0	0	0	0	0	0
L.O. 2	5	4	0	4	0	0	0	0	0	0	0
L.O. 3	5	4	0	4	0	0	0	0	0	0	0
L.O. 4	5	4	0	4	0	0	0	0	0	0	0
L.O. 5	5	4	0	4	0	0	0	0	0	0	0