

Course Code	Course Name	Teorical	Practice	Laboratory	Credits	ECTS
GE440	SATELLITE GRAVIMETRY	3.00	0.00	0.00	3.00	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>	: The aim of this course is to teach satellite gravity by focusing static and time-variable gravity fields.					
<b>Course Contents</b>	: In this course, the Earth's gravity field and its satellite-based observations will be handled. Satellite gravity missions (CHAMP, GRACE, GOCE and GRACE Follow-on) will introduce in this course.					
<b>Recommended or Required Reading</b>	: 1. Pail, R. (2023). Space Gravity Missions: CHAMP, GRACE, GRACE-FO, and GOCE, Satellite Projects. In: Sideris, M.G. (eds) Encyclopedia of Geodesy. Encyclopedia of Earth Sciences Series. Springer, Cham. 2. Flechtner, F., Reigber, C., Rummel, R. and Balmino G. (2021). Satellite Gravimetry: A Review of Its Realization. Survey Geophysics 42, 1029–1074. 3. Üstün, A. (2006). Gravite alanı belirleme amaçlı uydu misyonları: CHAMP, GRACE, GOCE ve ilk sonuçlar. Harita Dergisi 72 (136), 16–30. 4. Hofmann-Wellenhof, B., and Moritz H. (2006). Physical Geodesy. Second Corrected Edition, Springer. 5. International Centre for Global Earth Models (ICGEM), <a href="http://icgem.gfz-potsdam.de/">http://icgem.gfz-potsdam.de/</a> .					
<b>Planned Learning Activities and Teaching Methods</b>	: Within the scope of this course, students will be asked to carry out projects on determining the Earth's static and time variable gravity fields using the Earth gravity models.					
<b>Recommended Optional Programme Components</b>	: -					
<b>Instructors</b>	: Dr. Öğr. Üyesi Nevin Betül Avşar					
<b>Instructor's Assistants</b>	: -					
<b>Presentation Of Course</b>	: Face to face					
<b>En Son Güncelleme Tarihi:</b>	: 2/12/2024 4:25:22 PM					

## Course Outcomes

## Upon the completion of this course a student :

- 1 To understand the importance of gravity concept in geodesy.
- 2 To conceive the static gravity field and time-variable gravity field.
- 3 To comprehend the physical shape of the Earth.
- 4 To recognize the satellite gravity missions.
- 5 An ability of use of satellite gravity data.

## Preconditions

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Weekly Contents						
	Teorical	Practice	Laboratory	Preparation Info	Teaching Methods	Course Learning Outcomes
1.Week	*Introduction					
2.Week	*Gravity (Gravitational and Centrigucal Forces)					
3.Week	*Gravity (Gravitational and Centrigucal Forces)					
4.Week	*Laplace and Poisson Equations, Harmonic functions					
5.Week	*Series expansion of the gravitational potential					
6.Week	*The external gravity field of the Earth					
7.Week	*Spherical Harmonic Models (Gravity Models)					
8.Week					*Mid-term exam	
9.Week	*Static and time-variable gravity field					
10.Week	*Satellite-based gravity field observations					
11.Week	*Satellite-to-satellite tracking in the high-low mode (SST-HL) and CHAMP satellite mission					
12.Week	*Satellite gravity gradiometry (SGG) and GOCE satellite mission					
13.Week	*Satellite-to-satellite tracking in the low-low mode (SST-LL) and GRACE satellite systems					
14.Week	*GRACE / GRACE Follow on and their applications					
15.Week					*Final Exam	

Assesment Methods %
1 Mdterms : 20.000
2 Project : 20.000
3 Final : 60.000

ECTS Workload			
Activities	Count	Time(Hour)	Sum of Workload
Vize / Midterms	1	1.50	1.50
Proje / Project	1	20.00	20.00
Derse Katılım / Attending lectures	13	3.00	39.00
Ara Sınav Hazırlık / Preparation for midterm	1	20.00	20.00
Final Sınavı Hazırlık / Preparation for final	1	25.00	25.00
Final / Final	1	1.50	1.50
Rapor	1	20.00	20.00
			Total : 127.00
			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	0	0	0	0	0	0	0	0	0	0
L.O. 2	4	0	0	0	0	0	0	0	0	0	0
L.O. 3	4	0	0	0	0	0	0	0	0	0	0
L.O. 4	0	0	0	0	0	0	0	5	0	0	0
L.O. 5	4	5	5	0	0	0	0	5	0	0	0