



University of Isfahan

Course outline
Geomatics Engineering Undergraduate Program

Department of Civil Engineering
Faculty of Civil and Transportation Engineering
University of Isfahan

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1. Definition and goal

Geomatics engineering undergraduate program is one of the higher education programs that its goal is training skilled experts for mapping, implementation and spatial-based control of civil and industrial projects.

2. Duration of program and the structure

The average duration of this program is 4 years. Every semester lasts 16 complete weeks of education. Each theoretical course takes 16 hours, each laboratory course might take 32 or 48 hours, and each workshop or operation takes 48 hours each semester.

3. Credits

The total number of credits in this program is 140 that is described in Table 1. The titles of the aforementioned courses are as listed in Table 1 to 4.

Table 1. Course credits of Geomatics Engineering undergraduate program

No.	Type of courses	Credits
1	General courses	22
2	Basic courses	25
3	Core courses	85
4	Elective courses	8
Total		140

Table 2. General courses for Geomatics Engineering undergraduate program

No.	Course Title	Credits	Hours per week	
			Theoretical	Practical
01	Islamic Thought 1	2	2	-
02	Islamic Thought 2	2	2	-
03	Islamic Ethics	2	2	-
04	Islamic Revolution	2	2	-
05	Islamic History	2	2	-
06	Quran Studies	2	2	-
07	Human Right in Islam	2	2	-
08	General Literature	3	3	-
09	General Foreign Language	3	3	-
10	Physical Education 1	1	-	1
11	Physical Education 2	1	-	1
Total		22	20	2

Table 3. Basic courses for Geomatics Engineering undergraduate program

No.	Course Title	Credits	Hours per week	
			Theoretical	Practical
01	General Mathematics I	3	3	-
02	General Mathematics II	3	3	-
03	Differential Equations	3	3	-
04	Computer Programming	3	3	-
05	Numerical Analysis	2	2	-
06	Engineering Mathematics	3	3	-
07	Physics: Mechanics	2	2	-
08	Physics: Optics and Waves	2	3	-
09	Optics and Waves (Lab)	1	-	1
10	Linear Algebra	2	3	-
Total		25	24	1

Table 4. Core courses for Geomatics Engineering undergraduate program

No.	Course Title	Credits	Hours per week	
			Theoretical	Practical
01	Differential Geometry	2	2	-
02	Mathematical Statistics and Theory of Errors	3	3	-
03	Adjustment and Statistical Tests	3	3	-
04	Surveying I	2	2	-
05	Surveying Operations I	1	-	1
06	Surveying II	3	3	-
07	Surveying Operations II	1	-	1
08	Fundamentals of Cartography	3	3	-
09	Cartography Operations	1	-	1
10	Geodetic Surveying and Control Networks Analysis	3	3	-
11	Geodetic Surveying Operations	1	-	1
12	Route Surveying and Geometrical Design	3	3	-
13	Route Surveying and Geometrical Design Operations	1	-	1
14	Workshop and Subterranean Surveying	2	2	-
15	Fundamentals of Photogrammetry	3	3	-
16	Basic Photogrammetry (Lab)	1	-	1
17	Analytical Photogrammetry	3	3	-
18	Analytical Photogrammetry (Lab)	1	-	1
19	Triangulation in Photogrammetry	3	3	-
20	Triangulation in Photogrammetry (Lab)	1	-	1
21	Close Range Photogrammetry	2	2	-
22	Fundamentals of Remote Sensing	3	3	-
23	Remote Sensing Image Processing	2	2	-
24	Remote Sensing Image Processing (Lab)	1	-	1
25	Remote Sensing Image Analysis	2	2	-
26	Remote Sensing Image Analysis (Lab)	1	-	1
27	Hydrography	2	2	-
28	Fundamentals of Geodesy	2	2	-
29	Geometrical Geodesy	3	3	-

Table 4. Continued

No.	Course Title	Credits	Hours per week	
			Theoretical	Practical
30	Geometrical Geodesy (Operations and Computations)	1	-	1
31	Fundamentals of Space Geodesy	2	2	-
32	Physical Geodesy	3	3	-
33	Global Navigation Satellite Systems (GNSS)	3	3	-
34	Global Navigation Satellite Systems (Operations and Computations)	1	-	1
35	Cadaster	2	2	-
36	Geospatial Information Systems	2	2	
37	Geospatial Information Systems (Lab)	1	-	1
38	Computational Geometry	2	2	-
39	Spatial Databases and Geospatial System Development	2	2	-
40	Spatial Databases and Geospatial System Development (Lab)	1	-	1
41	Principles of Project Management in Surveying	2	2	-
42	Internship Camp	4	-	4
Total		85	67	18

Table 5. Elective courses for Geomatics Engineering undergraduate program

No.	Course Title	Credits	Hours per week	
			Theoretical	Practical
01	Technical Language for Surveying	2	2	-
02	Introduction to Construction Sites	2	2	-
03	Multi-Criteria Decision Making	2	2	-
04	Map Projections in Cartography	2	2	-
05	Construction Materials	2	2	-
06	Statics and Strength of Materials	3	3	-
07	Fundamentals of Soil Mechanics	2	2	-
08	Soil Mechanics (Lab)	1	-	1
09	Advanced Instruments and Software in Geomatics	1	1.5	0.5
10	Project	2	2	-
11	Precise Geodesy and Industrial Surveying	3	2	1
12	Land-use Planning	2	2	-
13	Urban Planning	2	2	-
14	Architectural and Urban Design	2	2	-
15	Cadaster II	2	2	-
16	Engineering Geology	2	2	-
17	Advanced Computer Programming	2	2	-
18	Space Mapping	2	2	-
19	Applied Remote Sensing	2	2	-