



## HÖGSKOLAN I GÄVLE

### Geodetic Reference Systems 7.5 cr

*Geodetiska referenssystem 7,5 hp*

Set by Faculty of Engineering and Sustainable Development

**Version**

**Set at**

**Valid from**

2/27/19

**VT2020**

<b>Level</b>	G2F
<b>Education level</b>	First cycle
<b>Course identifier</b>	SBG209
<b>Credits</b>	7.5 cr
<b>Main field of study</b>	Geospatial Information Science, Geomatics, Surveying Technology
<b>Subject group</b>	Geographic Information Technology and Surveying
<b>Disciplinary domain</b>	Technology 100.0 %

**Learning outcomes**

After completion of the course the student shall be able to

1. perform calculations of spherical trigonometry applied on a spherical earth model and a celestial sphere
2. state different time concepts of importance for Geodesy
3. make conversions between, celestial coordinate systems: declination, right ascension, hour angle, altitude and azimuth
4. discuss the irregularities of the rotation of the Earth: precession, nutation and polar motion
5. perform calculations of positions, distances and directions on an ellipsoidal earth model
6. describe international geodetic reference systems and explain their connections to national reference systems
7. describe geoid modeling using different methods and its importance for height systems
8. compile a scientific report on findings from literature studies and/or an experiment related to geodetic reference system, and present it at a seminar.

**Course content**

Spherical trigonometry applied on a spherical earth model with a transition to an ellipsoidal earth model  
Global terrestrial and celestial reference systems and their connections to national reference systems  
Time definitions and their application in the geodetic reference system

Earth rotation and polar motions: precession, nutation and polar wander.  
 Transformations between 3D-systems  
 Gravitation, the geoid concept and height systems  
 Geodynamics and its relation to reference system: plate motions, vertical land motion and tidal earth  
 Research and international cooperations within the field of geodesy

<b>Teaching</b>	Lectures, exercises, practicals and project work			
<b>Prerequisites</b>	Geodetic Measurement Uncertainty Theory and Network Adjustment 7.5 cr and Geodetic Measurement Instruments 7,5 cr or equivalent			
<b>Examination</b>	0010 Assignments 3.0 cr, Grade: Pass/Fail 0020 Project work 4.5 cr, Grade: AF			
<b>Grade</b>	A, B, C, D, E, Fx, F			
<b>Other regulations</b>	Degree criteria for final grade will be given by examiner or course responsible latest at the beginning of the course.			
<b>Sustainable environment</b>	A minor part of the course content deals with sustainable development.			
<b>Module</b>	0010	Assignments	3 cr	Grade: UG
	0020	Project Work	4.5 cr	Grade: AF