



## HÖGSKOLAN I GÄVLE

### Satellite Sensors and their Applications in Geospatial Information Science 5 cr

*Satellitesensorer och deras tillämpningar i geospatial informationsvetenskap 5 hp*

Set by Faculty of Engineering and Sustainable Development

**Version**

**Set at**

**Valid from**

8/22/16

**HT2017**

<b>Level</b>	A1N
<b>Education level</b>	Second cycle
<b>Course identifier</b>	SBA034
<b>Credits</b>	5 cr
<b>Main field of study</b>	Geospatial Information Science, Geomatics, Geography, Surveying Technology
<b>Subject group</b>	Geographic Information Technology and Surveying
<b>Disciplinary domain</b>	Technology 100.0 %

**Learning outcomes**

The aim of the course is to provide knowledge of advanced methods and techniques of global satellite sensors and their applications in different fields of geospatial information science such as: geodesy, geophysics, geodynamics, tectonics, meteorology, hydrology and oceanography.

After completion of the course the student shall be able to

1. explain different satellite methods and techniques and their applications in geospatial information science; e.g. plate tectonics, natural hazards, global topography and bathymetry, postglacial rebound, sea level and ocean dynamics, weather and atmospheric dynamics
2. analyse and interpret satellite observations e.g. for monitoring of different objects including e.g. crustal deformation, dams, bridges, etc.
3. apply advanced techniques of satellite data processing for solving various geoscientific tasks (e.g. climate change, crustal deformation, etc.)
4. demonstrate for changes in the Earth dynamic system (due to geodynamical phenomena) by the analysis of satellite data
5. perform a project work using satellite data.

<b>Course content</b>	<ul style="list-style-type: none"> <li>• A description of the scientific and societal problems, as well as practical applications that benefit from satellite sensors, observations, services and products.</li> <li>• GNSS techniques and their applications (e.g. in climate change studies).</li> <li>• Satellite techniques in monitoring of deformation (GNSS),</li> <li>• Satellite Gravimetry and Earth Dynamics (studying climate change due to different causes).</li> <li>• Principles of satellite radar altimetry and its applications.</li> <li>• Environmental and climate monitoring using satellite altimetry mission (to measure sea-surface topography, sea- and land-surface temperature).</li> <li>• Measurements and analysis of the natural or human-made Earth surface deformation using GNSS and SAR Interferometry (InSAR).</li> </ul>			
<b>Teaching</b>	Lectures, practicals, and project work.			
<b>Prerequisites</b>	<p>English language proficiency equivalent to (the Swedish upper secondary school) English course 6/B.</p> <p>A first-cycle qualification comprising at least 180 credits in relevant subject of the Master's programme in Geospatial information science, or a corresponding qualification from abroad.</p>			
<b>Examination</b>	Assignments (practicals), seminars, and project work			
<b>Grade</b>	A, B, C, D, E, Fx, F			
<b>Other regulations</b>	Criteria for final grade will be handed out 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 (practicals)	2 cr	Grade: UG
	0020	Project work	3 cr	Grade: AF