

**Geoinformation Products Management**

Code: 43853  
ECTS Credits: 6

Degree	Type	Year	Semester
4315985 Geoinformation	OT	0	2

The proposed teaching and assessment methodology that appear in the guide may be subject to changes as a result of the restrictions to face-to-face class attendance imposed by the health authorities.

**Contact**

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**Use of Languages**

Principal working language: spanish (spa)

**External teachers**

Ariadna Just  
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**Prerequisites**

This course has no specific requirements beyond a general knowledge of the field of geoinformation.

**Objectives and Contextualisation**

The aim of the course is that students learn the methods and techniques required to develop product definitions business models, dissemination plans and digital marketing plans in the field of geoinformation.

In addition the course includes a part dedicated to 3D geoinformation products, as this is the newest and growing geoinformation type. 3D models are becoming a highly demanded tool for urban planning and environmental modeling. 3D city models can help governments and investors in making decisions, devising and implementing strategic plans addressed to the economic development and social welfare. There are more and more cities that are converting its geospatial data from a 2D paradigm to a 3D one. This part of the course gives an overview on the state of the art of 3D models, applications and tools, as generative of new economy and business opportunities in the field of geoinformation. The specific goals of this part of the course are:

- Provide basic knowledge to understand, generate and apply the three-dimensional data supplied by the Earth observation systems..
- Provide theoretical and practical knowledge on the technologies and tools used for acquiring, processing and analyzing 3D geoinformation.
- Understand the potential that 3D geoinformation has for urban and environmental management.

**Competences**

- Analyze user needs and the formal and interface requirements to define and design end- user geospatial applications in corporate environments or those open to the public.
- Communicate and justify conclusions clearly and unambiguously to both specialised and non-specialised audiences.

- Continue the learning process, to a large extent autonomously.
- Design and elaborate cartographic documents and, in general, geovisualization of geospatial data products, and implement the corresponding production and publication processes using analogue and digital media.
- Design and manage geospatial information application products or services.
- Design intelligent applications of geospatial information for managing cities and region (smart cities) and for managing their implementation.
- Develop and apply monitoring and evaluation procedures for geoinformation products and services.
- Develop imaginative, creative and innovative ideas in projects for geospatial information systems, services, products or applications.
- Direct and manage geospatial information systems, services, products and applications projects, from a strategic, technical, economic and human resources and materials angle.
- Integrate knowledge and use it to make judgements in complex situations, with incomplete information, while keeping in mind social and ethical responsibilities.
- Solve problems in new or little-known situations within broader (or multidisciplinary) contexts related to the field of study.
- Use acquired knowledge as a basis for originality in the application of ideas, often in a research context.
- Use knowledge critically and understand and take on board the ethical responsibility, legislation and social implications of the use and diffusion of geospatial information and its derived products.

## Learning Outcomes

1. Analyse the needs of geoinformation users in order to define new data and information-service products.
2. Communicate and justify conclusions clearly and unambiguously to both specialised and non-specialised audiences.
3. Continue the learning process, to a large extent autonomously.
4. Define indicators for monitoring and evaluation procedures for geoinformation products and services.
5. Define measures to ensure and maintain the traceability of geoinformation products and services.
6. Develop and implement imaginative, creative and innovative ideas in the processes of projecting and designing cartographic documents.
7. Develop imaginative, creative and innovative ideas in projects for geospatial information systems, services, products or applications.
8. Direct and manage geospatial information systems, services, products and applications projects, from a strategic, technical, economic and human resources and materials angle.
9. Establish quality control systems for geoinformation products and services.
10. Establish the strategy for distributing or commercialising geospatial information products or services.
11. Establish the technical project for producing and distributing geospatial information products or services.
12. Establish the technical specifications of geospatial information products or services.
13. Generate and manage projects organised by content criteria.
14. Integrate knowledge and use it to make judgements in complex situations, with incomplete information, while keeping in mind social and ethical responsibilities.
15. Know current trends and market segments in relation to the business of producing, processing and distributing geoinformation.
16. Know the different types of general and specific licences for distribution, use and reproduction in the case of geospatial data and software.
17. Know the legislation on publication and dissemination of data and results deriving from cartography and geospatial information and, in general, all kinds of data, including the protection of personal data.
18. Manage the human, technical and material resources for executing projects to produce and distribute geospatial information products or services.
19. Recognise the potential of new technologies for generating geoinformation.
20. Solve problems in new or little-known situations within broader (or multidisciplinary) contexts related to the field of study.
21. Use acquired knowledge as a basis for originality in the application of ideas, often in a research context.
22. Use knowledge critically and understand and take on board the ethical responsibility, legislation and social implications of the use and diffusion of geospatial information and its derived products.
23. Write and manage R&D projects in the field of smart city management.
24. Write and manage R+D+I projects in the field of smart city management.

## Content

### Marketing and distribution of geoinformation products and services

1. Introduction.
2. The value of the idea.
3. Business models vs. business plans.
4. Customer development.
5. Value proposition canvas.
6. Business model canvas.

Value proposal.

Segments of customers.

Channels.

Relationship with customers.

Revenue model.

Partners.

Examples.

7. Prototyping. Digital marketing.

Digital marketing plan

The website

Lead generation

SEO, SEM and *AdWords*

*Google Analytics*, logs and cookies.

Digital marketing on social networks

### 3D Geoinformation: Uses, applications and the urban ecosystem

1. Motivation of the 3D
2. Capture three-dimensional data
  - Active sensors
  - Passive sensors
3. Semantic interpretation of a 3D point cloud
  - Classification
  - Segmentation
4. 3D City Modelling

Principles

Creation of 3D city models

Use cases

#### 5. The 3D in the urban ecosystem and natural environments

Principles

Vegetation modelling

Use cases

#### 6. Towards a three-dimensional representation of the land. Why?

## Methodology

Learning is achieved by means of three types of activities:

**Directed activities:** Directed activities are theoretical and practical lectures in a computer lab. They include solving case studies and practical exercises, using as the main method a problem based learning approach. Lectures serve to systematize all the content, to present the state of the art of the different subjects, to provide methods and techniques for specific tasks, and to sum up the knowledge to learn. Lectures organize also the autonomous and complementary work done by the students.

**Supervised activities:** Supervised activities are focused on the execution of a semester project, consisting of a real case study, carried out through workshop hours, autonomous work and tutorials. This semester project allows to apply together all the knowledge and technical skills learnt in all the courses of the semester. The semester project is a milestone for the students and the actual demonstration that they had achieved the learning goals of all the courses of the semester. It is also the main evidence for evaluation as students should have to submit at the end of the semester a report that summarizes the whole project and do an oral presentation.

**Autonomous activities:** Autonomous work of the students includes personal readings (papers, manuals, relevant reports, etc.), data and documentation search, complementary exercises and the personal development of the semester project.

The activities that could not be done onsite will be adapted to an online format made available through the UAB's virtual tools. Exercises, projects and lectures will be carried out using virtual tools such as tutorials, videos, Teams sessions, etc. Lecturers will ensure that students are able to access these virtual tools, or will offer them feasible alternatives.

**Annotation:** Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

## Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Guided exercises and presentations	12	0.48	1, 7, 8, 14, 20, 2, 22
Lectures on basic concepts	24	0.96	16, 15, 11, 10, 3, 21
Type: Supervised			

Semester project, exercises, seminars	15	0.6	1, 16, 17, 7, 8, 11, 13, 18, 14, 20, 3, 23, 24
Type: Autonomous			
Knowledge synthesis and service design	30	1.2	1, 11, 12, 14, 20
Readings, personal study and exercises	39	1.56	16, 17, 15, 11, 12, 10, 3

## Assessment

In the event that assessment activities cannot be taken onsite, they will be adapted to an online format made available through the UAB's virtual tools (original weighting will be maintained). Homework, activities and class participation will be carried out through forums, wikis and/or discussion on Teams, etc. Lecturers will ensure that students are able to access these virtual tools, or will offer them feasible alternatives.

### CONTINUOUS EVALUATION

#### a) Evaluation procedure and activities:

Evaluation of the course is based mostly on the semester project, that comprises two evaluation activities. The elaboration and submission of a synthesis report and the oral presentation of the project done. Given the technical content of the course, the weight assigned to the project report is 45% of the total course grading, assuming that it is the most appropriate means to explain all the technical details of the project, and a weight of 25% at the oral presentation. The course assessment is completed with the evaluation of the practical exercises done along the course, that account for another 30% of the total course grading.

Except when expressly noticed, all the evaluation activities (report and oral presentation of the semester project, as well as practical exercises) have to be carried out individually.

Time assigned to each evaluation activity includes the time spent in making all the material evidences for evaluating each activity (e.g., writing of the report, preparing the presentation slides, etc.).

#### b) Evaluation schedule:

2<sup>nd</sup> semester project report: Making during all the semester. Submission at the end of semester, on April 3<sup>rd</sup> 2022.

2<sup>nd</sup> semester project oral presentation: Making during all the semester. Oral presentation at the end of semester, on April 8<sup>th</sup> 2022.

Course practical exercises: Making and submission weekly or biweekly along the semester.

#### c) Grade revision:

Once the grades obtained are published, students will have one week to apply for a grade revision by arranging an appointment with the corresponding teachers.

#### d) Procedure for reassessment:

2<sup>nd</sup> semester project report: It could be reassessed in the following two weeks after the submission date scheduled. Reassessment will require the submission of a new whole report in case of negative evaluation of the former report submitted.

2<sup>nd</sup> semester project oral presentation: It could be reassessed in the following week after the date scheduled for the oral presentation. Reassessment will require doing again the oral presentation in case of negative evaluation of the former presentation done.

Course practical exercises: Can not be reassessed.

To have right to a reassessment the student will have to have been previously evaluated in a set of activities that account for at least two thirds of the total course grading. Therefore he or she will have to have been evaluated of the 1st semester project report (40%) and of the 1st semester project oral presentation (30%) in the dates scheduled.

The right to a reassessment will only be granted to students that, having not passed the course (e.g., having a total course grade below 5 over 10), had obtained at least a total course grade above 3,5 over 10.

e) Conditions for a 'Not assessable' grade:

Students will receive the grade 'Not assessable' instead of 'Fail' if they had not submitted neither the 2nd semester project report nor done the 2nd semester project oral presentation. That is, if they only submit all or part of the course practical exercises.

f) UAB regulations on plagiarism and other irregularities in the assessment process:

In the event of a student committing any irregularity that may lead to a significant variation in the grade awarded to an assessment activity, the student will be given a zero for this activity, regardless of any disciplinary process that may take place. In the event of several irregularities in assessment activities of the same subject, the student will be given a zero as the final grade for this subject..

Assessment activities with a zero grade because of irregularities can not be reassessed.

## Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Oral presentations	25	9	0.36	1, 16, 17, 6, 7, 8, 20, 2, 19, 22
Practical exercises	30	9	0.36	4, 5, 7, 8, 10, 9, 3, 22
Report submissions	45	12	0.48	15, 4, 5, 7, 8, 11, 12, 10, 9, 13, 18, 14, 20, 3, 23, 24, 21, 22

## Bibliography

Weinmann, Ma., Jutzi B., Mallet, C., Weinmann, Mi. "Geometric features and their relevance for 3D points cloud classification". *ISPRS Annals of Photogrammetry. Remote Sensing and Spatial Information Sciences*, 2017.

Blomley, R., Weinmann, M. "Using multi-scale features for the 3D semantic labeling of airborne laser scanning data". *ISPRS Annals of Photogrammetry. Remote Sensing and Spatial Information Sciences*, 2017.

Renslow, Michael. *Manual of Airborne Topographic LiDAR*. Bethesda, Maryland: The American Society for Photogrammetry and Remote Sensing, 2013.

Biljecki, F., Ledoux, H., Stoter, J., Zhao, J. "Formalisation of the level of detail in 3D city modelling". *Computers, Environment and Urban Systems*, 2014.

Julin, A., Jaalama, K., Virtanen, J., Pouke, M., Ylipulli, J., Vaaja, M., Hyypä, J., Hyypä, H. "Characterizing 3D City Modeling Projects: Towards a Harmonized Interoperable System". *International Journal of Geo-Information*, 2018.

[https://www.gis.fhwa.dot.gov/documents/gis\\_business\\_models.pdf](https://www.gis.fhwa.dot.gov/documents/gis_business_models.pdf)

<https://www.alexandercowan.com/business-model-canvas-templates/>

<https://www.st-andrews.ac.uk/media/careerscentre/documents/Business%20Model%20Canvas%20Support%20I>

## **Software**

ArcGis Desktop

LAStools

Cloudcompare

Fusion (USDA)