

## Course guide

### 290601 - MATI14 - Analytic Geometry

Last modified: 14/07/2025

**Unit in charge:** Vallès School of Architecture  
**Teaching unit:** 753 - TA - Department of Architectural Technology.  
**Degree:** DEGREE IN ARCHITECTURE STUDIES (Syllabus 2014). (Compulsory subject).  
**Academic year:** 2025    **ECTS Credits:** 6.0    **Languages:** Catalan

#### LECTURER

**Coordinating lecturer:** DIONIS BOIXADER IBAÑEZ

**Others:**

Fernando Abárzuza Ascasso  
Xavier Ros Roca

#### DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

##### Specific:

EAB1G. An aptitude for applying graphic skills to the representation of spaces and objects (T).  
 EAB2G. An aptitude for conceiving and representing the visual attributes of objects and mastering proportion and drawing techniques in general, including computer drawing techniques (T).  
 EAB3G. Adequate knowledge of spatial representation systems applied to architecture and urbanism.  
 EAB4G. Adequate knowledge of the analysis and theory of form and visual perception laws applied to architecture and urbanism.  
 EAB5G. Adequate knowledge of metric and projective geometry applied to architecture and urbanism.  
 EAB6G. Adequate knowledge of graphic surveying techniques at all stages, from sketching to scientific restitution, applied to architecture and urbanism.  
 EAB7G. Adequate knowledge of the principles of general mechanics, statics, mass geometry and vector and tensor fields applied to architecture and urbanism.  
 EAB11G. Applied knowledge of numerical calculus, analytic and differential geometry and algebraic methods.

##### Generical:

CE2. Adequate knowledge of the history of architecture and architectural theories, as well as the arts, technological and human sciences associated with architecture.

#### TEACHING METHODOLOGY

#### LEARNING OBJECTIVES OF THE SUBJECT

Represent by coordinates and equations, planes, lines, enclosures, curves, surfaces and other geometric entities. Formulate vectorial models for problems of geometric, physical and other applied nature. Solve these problems with the help of matrix calculation. Identify processes and situations mathematically modelable as transformations. Answer questions and solve written exercises in a synthetic, structured and understandable way. Apply graphic design to the design and architecture. 2D and 3D reference systems.

#### STUDY LOAD

Type	Hours	Percentage
Self study	84,0	56.00
Hours medium group	33,0	22.00
Hours large group	33,0	22.00

Total learning time: 150 h

## CONTENTS

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### Syllabus

**Description:**

A survey on linear algebra and geometry, specially focused on coordinates and their application to 3D representation. Basic undergraduate level.

**Full-or-part-time:** 66h

Theory classes: 33h

Practical classes: 33h

## GRADING SYSTEM

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## BIBLIOGRAPHY

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**Basic:**

- Alsina, Claudi; García Roig, Jaume Lluís; Jacas Moral, Joan. Temes clau de geometria. Barcelona: Universitat Politècnica de Catalunya, DL 1992. ISBN 8476531974.
- Hausner, Melvin. A Vector space approach to geometry. Mineola [N.Y]: Dover, 1998. ISBN 0486404528.
- Guijarro Carranza, Piedad; Cruells Pagès, Pere. Matemàtiques per a l'arquitectura : problemes resolts. Barcelona: Edicions UPC, 2002. ISBN 848301579X.
- Pottmann, Helmut. Architectural Geometry. Exton, PA: Bentley Institute Press, 2007. ISBN 9781934493045.
- Zalewski, Wacław; Allen, Edward. Shaping structures : statics. New York, [NY]: Wiley, cop. 1998. ISBN 0471169684.