

## Topography and technical drawing (1<sup>st</sup> YEAR, 2<sup>nd</sup> SEMESTER)

No. of transferable credits 5

### Discipline type

Speciality discipline (compulsory)

### Course leader

Prof.univ. dr. Valeriu MOCA

### Discipline objectives (course and practical activities)

Given its structure and content, the course gives the students the possibility of developing their theoretical and practical knowledge on the present methods and technologies used in agriculture for terrestrial measurements. Simultaneously, it deals with the study of the present methods of drawing up topographic plans and solving various practical problems using maps and topographic plans and/or cadastral plans.

The practical activity is intended to familiarize the students with the instruments and the classical and modern topographic devices used nowadays for topographic and cadastral surveying, the use of topographic and cadastral documentations for surface assessment, absolute land quotas and land slope.

The project application refers to the practical processing of the primary data resulting from field measurements: drawing up cadastral plans, calculating surfaces and representing the field relief using the level curves method.

### Discipline content (analytical programme)

Course (Chapters / Sub-chapters)
<b>Fundamental notions:</b> the object of terrestrial measurements; the role and the importance of topographic works in agriculture; measure units used in topography; topographic elements of the land; basic topographic calculations, numerical and graphic topographic scales; topographic maps and plans; information on measurements and errors in topography.
<b>Planimetry:</b> general information; marking and signalling topographic points; measuring the distances; measuring the angles; the classical and satellite geodetic support network; planimetric surveys using the traversing method; planimetric surveys using the radiation method; drawing up topographic plans; the notion of surface and numerical, mechanical and graphical calculation methods; the admitted tolerance in calculating surfaces.
<b>Levelling (survey of heights) :</b> general information on levelling; types of levelling; the classical geodetic levelling network; the geometric levelling; methods of representing the field relief on maps and topographic plans; calculating the slope of lands; the numeric representation of the land slope; establishing the slope of the land on maps and topographic plans with level curves.
<b>Tachymetry:</b> general tachymetry notions; instruments and classical and modern tachymetric surveys; tachymetric surveys using total measuring stations
<b>Elements of technical and cartographic drawing:</b> basic elements of cartographic writing; cartographic writing on maps and plans; the format of map and plan framing; the elements of map and plan framing; the editing of topographic and/or cartographic plans and maps; the nomenclature of map and plan sheets; cartometry issues.

<b>Practical activity</b>
<b>The direct measuring of distances:</b> setting out the alignments; classical instruments for the direct measuring of distances; the direct measuring technique of distances using a steel measuring tape; measuring a land surface using a steel measuring tape; distance measuring instruments with waves; measuring distances, surfaces and volumes using laser meters
<b>Classical and modern instruments for measuring angles and distances:</b> general considerations and principles; classical theodolites and tachymeters; modern optical theodolites and tachymeters; electronic tachymeters or total stations; angle reading devices.
<b>Angle and distance measuring using theodolites and tachymeters:</b> placing the instrument in the station point; observing the topographic signs for measuring horizontal angles, zenithally vertical angles and distances using optical methods; recording the primary data in the field book and processing the angular and linear measurements.
<b>Geometric levelling instruments and methods:</b> classical levels with manual horizontalization; modern levels with automatic horizontalization; verification and rectification of classical levels; placing the levelling instrument on the station point; reading the topographic levelling staff; performing the operations during the on field phase and calculation phase in the case of the simple middle geometric levelling
<b>Topographic maps and plans:</b> definition and classification of maps and plans; map and plans format and sizes; cartographic elements of maps and plans; the nomenclature of map sheets and plans; practical applications on maps and plans.
<b>Project</b>
<b>Drawing up the basic topographic plan:</b> elements of planimetry, hydrography, altimetry and writing; works in the preliminary phase; reporting the points from the support and survey network; the graphic reporting accuracy; verifying the reporting of points; uniting the reported points; drawing up the level curves on the plan; the average altitude error of a level curve; plotting the basic topographic-cadastral plan and the situation plan with level curves.
<b>Calculating the surfaces:</b> including in the cadastral plan the symbols for the land usage categories; the temporary cadastral numbering of sectors and parcels; calculating the surfaces of cadastral sectors and parcels; drawing up the cadastral registry of parcels.
<b>The calculation of detachments and parcelling:</b> general conditions of detaching and parcelling; the calculations of numerical parcelling in series of parcels; drawing up and writing the parcelling plan
<b>Drawing up and writing a topographic profile:</b> identifying the absolute quotas from the topographic plan with level curves; the calculation of the slope of an alignment from the topographic plan with level curves; drawing up and writing a longitudinal profile from the topographic plan with level curves
<b>Final assessment - oral examination</b>

### **Bibliography**

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12. xxx *Lucrări geodezice, topografice, fotogrammetrice și cadastrale*, Editura MatrixRom, București, 2007

### Final assessment

Assessment forms	Assessment methods	Percent of the final grade
Examination	Oral evaluation	65%
Assessment of the activity during the semester	Assessment during the semester; verification tests; practical activity and project	35%

### Contact person

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