

CADASTRAL AND LIS

ENGE 305

Lecture : 4
Tutorial : 0
Practical : 0

Year : III
Part : I

Course Objectives:

The objective of this course is to equip students with the knowledge and skills of cadastral and land information system (LIS) and applications relevant to geomatics engineering. After completion of this course students will be able to plan and conduct cadastral surveys using modern tools and techniques; prepare, maintain, and manage comprehensive cadastral documents and databases; utilize contemporary technology and software for enhancing cadastral surveys and data management; recognize and apply the integration of cadastral data with other geospatial systems.

1 Introduction (6 hours)

- 1.1 Historical background
- 1.2 Importance of cadastre
- 1.3 Development of cadastral system in Nepal
- 1.4 Concept, principle and types of cadastre
- 1.5 Cadastral system (Analog and digital)

2 Components of Cadastre (6 hours)

- 2.1 Cadastral maps and their types
- 2.2 Field book and related documents
- 2.3 Schema, database and data model
- 2.4 Data security and archive (Analog and digital)
- 2.5 Parcel and Boundary
 - 2.5.1 Parcel numbering system
 - 2.5.2 Boundary and demarcation

3 Approaches of Cadastral Survey (6 hours)

- 3.1 Sporadic versus systematic
- 3.2 Free sheet versus trigonometrically controlled sheet
- 3.3 Isolated versus seamless cadastral data
- 3.4 Analog versus digital

- 4 Technical Requirements (8 hours)**
- 4.1 Projection system
 - 4.2 Geodetic network control points
 - 4.3 Map sheet numbering system
 - 4.4 Specifications and standards for analog and digital cadastre
- 5 Cadastral Mapping Techniques and Procedure (10 hours)**
- 5.1 Digitization/Annotation on existing map/image
 - 5.2 Chain/tape, compass and plane table alidade
 - 5.3 Total station, photogrammetry, GNSS, UAV, LiDAR and hybrid methods
 - 5.4 Comparison of different methods
 - 5.5 Cadastral Survey Procedure: Analog and Digital
- 6 Land Registration (4 hours)**
- 6.1 Conveyancing
 - 6.2 Registration of deed
 - 6.3 Registration of title
- 7 Stakeholder and Legal Framework of Cadastral System (6 hours)**
- 7.1 Stakeholders
 - 7.2 Land Measurement Act 2019
 - 7.3 Land Measurement Regulations 2058
- 8 Land Information System (LIS) (8 hours)**
- 8.1 Development of LIS in Nepal
 - 8.2 Importance and components
 - 8.3 Role and benefits
 - 8.4 Data: Sources, acquisition, preparation, maintenance, dissemination and use
 - 8.5 User interaction
 - 8.6 Stakeholders and their role
- 9 International Practices (6 hours)**
- 9.1 Examples of modern cadastral system implemented around the world
 - 9.2 International professional organizations in cadastral surveying
 - 9.3 International conventions and declarations in cadastral surveying
 - 9.4 Ethics, professionalism and code of conduct

Final Exam

The questions will cover all the chapters in the syllabus. The evaluation scheme will be as indicated in the table below:

| Chapter | Hours | Marks distribution* |
|--------------|-----------|---------------------|
| 1 | 6 | 6 |
| 2 | 6 | 6 |
| 3 | 6 | 6 |
| 4 | 8 | 8 |
| 5 | 10 | 10 |
| 6 | 4 | 4 |
| 7 | 6 | 6 |
| 8 | 8 | 8 |
| 9 | 6 | 6 |
| Total | 60 | 60 |

* There may be minor deviation in marks distribution.

References

1. Benham, G., Smith, M. (2010). Cadastre: An introduction.
2. Dale, P. F., McLaughlin, J. D. (1999). Land administration (Latest Edition). Oxford University Press.
3. Kaufmann, J., Steudler, D. (2014). Cadastre 2014: A vision for a future cadastral system. International Federation of Surveyors.
4. Longley, P. A., et al. (2015). Geographical information systems and science. Wiley
5. Goodchild, M. F., Janelle, D. G. (2004). Spatially integrated social science: Challenges in data analysis and modeling. Oxford University Press.
6. Elwood, S., Leszczynski, A. (2013). Policy and planning in a digital age: Changing GIS practices.
7. Department of Survey. (2025). Collection of laws related to land surveying. Government of Nepal.