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EVNS 501: Geographical Information System

eLearning Module

Course Teacher

Prof. S Jayakumar

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Pondicherry University

Puducherry, India

Pondicherry University, India

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1. General Information

Course Code	:	EVNS - 501
Course Title	:	Geographical Information
System Number of Credits	:	4.5 ECTS
Course duration	:	18 Weeks
Level	:	Postgraduate
Course Teacher	:	Prof. S. Jayakumar
Prerequisite	:	Required courses (or equivalents): Basic understanding on Mathematics (school higher level), English language skill, computer operation (Windows/Mac).

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2. Course description

This course provides the fundamentals and basic concepts of Geographical Information System. The basic methods and procedures in Quantum GIS is also taught in the course. The basic operations such as downloading of open source satellite data, geometric correction of topo maps, digitization, head- up interpretation and map composition are also being taught as part of this course.

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3. Course goals

The main course objective is to provide a basic understanding on What is GIS and how it can be used to various fields.This course allows the students to acquire hands-on knowledge and skills on GIS software, data handling, spatial analysis.

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4. Course outcome

By the end of the course, successful students will:

1. Know the basic concepts and fundamentals of geographic information system
2. Handle GIS software independently
3. Know the different between spatial and non- spatial data, data quality and analysis
4. Approach the environmental problems spatially to find suitable solutions.
5. Handle raster and vector maps and other spatial data to integrate into GIS domain
6. Apply the spatial methods and procedures to find solutions to the environmental problem
7. Be able to identify the root cause for the problem
8. Be able to prepare strategic solution to the environmental problem

5. Course

5.a. Course Content

Week 1	1. Introduction to GIS
	2. How does GIS work?
	3. Components of GIS
Week 2	4. Cartography and Nature of Maps - 1
	5. Cartography and Nature of Maps - 2
	6. Essential Map elements
Week 3	7. Coordinate system and projection
	8. Attribute data and Thematic Mapping
Week 4	9. Vector data model
	10. Creating thematic map
Week 5	11. Data classification
Week 6	12. Arc Node topology
	13. Polygon arc topology
Week 7	14. Introduction to QGIS
Week 8	15. GIS terms and definitions - 1
	16. GIS terms and definitions - 2
Week 9	17. Topology and Shape files
	18. Selection methods in GIS
Week 10	19. Generalization Problem
Week 11	20. Overlay methods
Week 12	21. Raster data model 1
Week 13	22. Raster data model 2
Week 14	23. Raster data analysis 1
	24. Raster data analysis 2
Week 15	25. QGis Elements - 1
	26. QGis Elements – 2
Week 16	27. Grass gis Elements

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5. Course

5.b. Mode of delivery – Hybrid

In-Class Lectures

PULSE
PONDICHERRY UNIVERSITY LEARNING SYSTEM

On-line Lectures

Microsoft One Drive

Microsoft Teams

Students will get enrolled in Pondicherry University Learning Management System and the classes will be handled in hybrid mode

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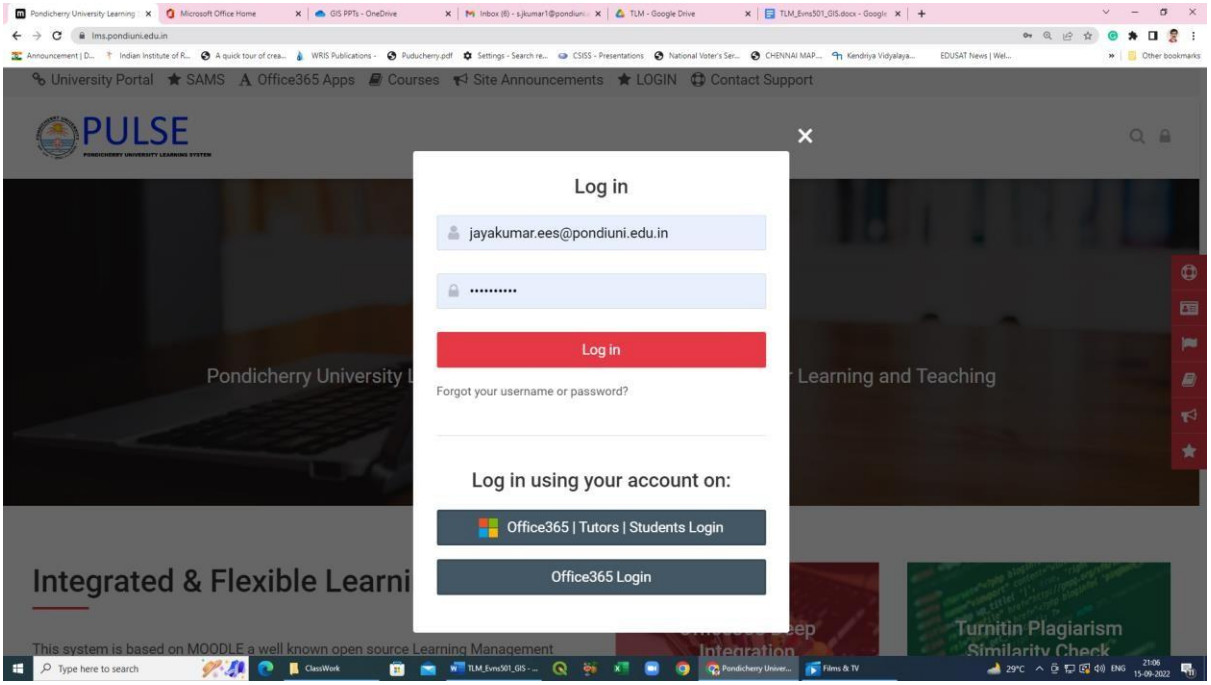
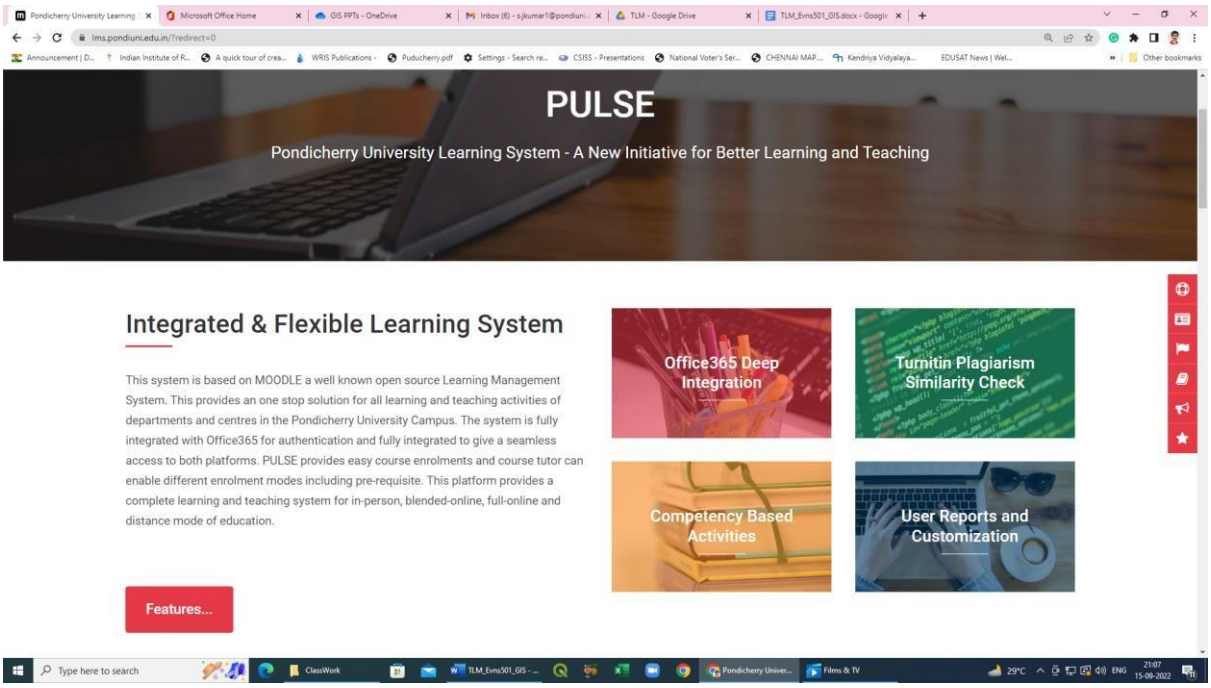
Pondicherry University Learning Management System (https://lms.pondiuni.edu.in/)





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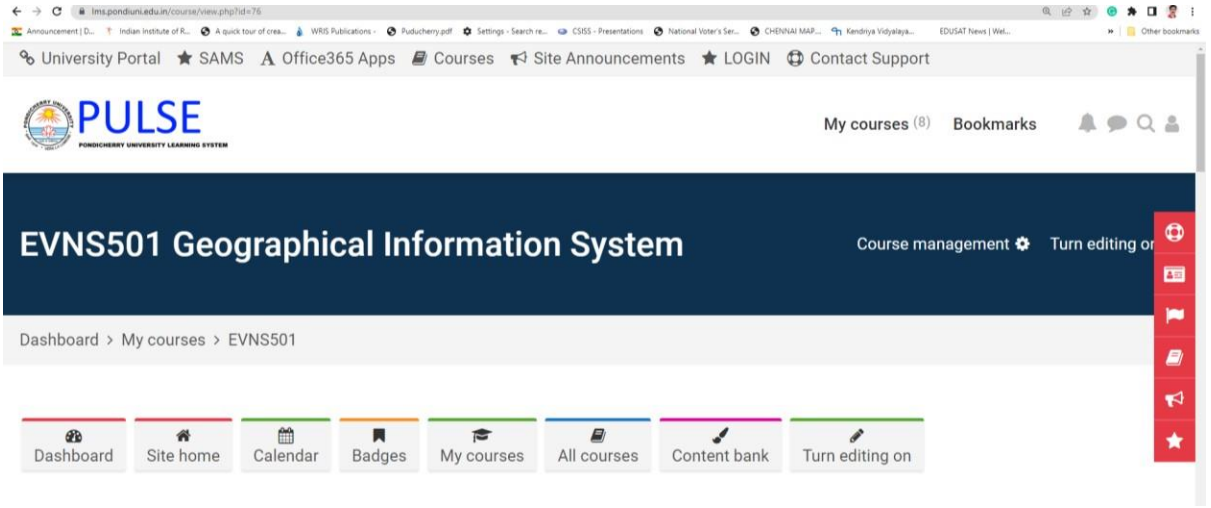
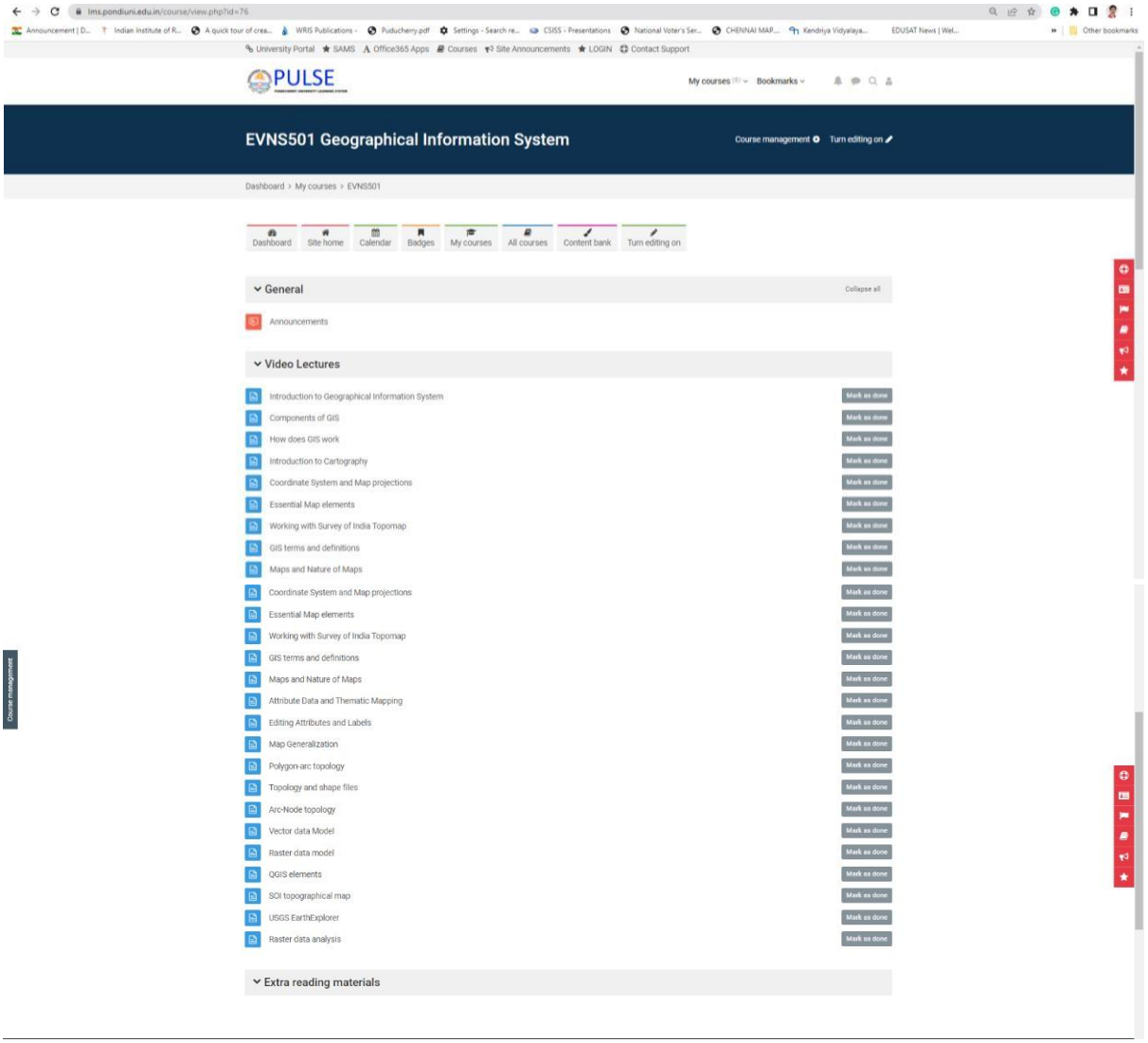


Video Lectures linked to PULSE



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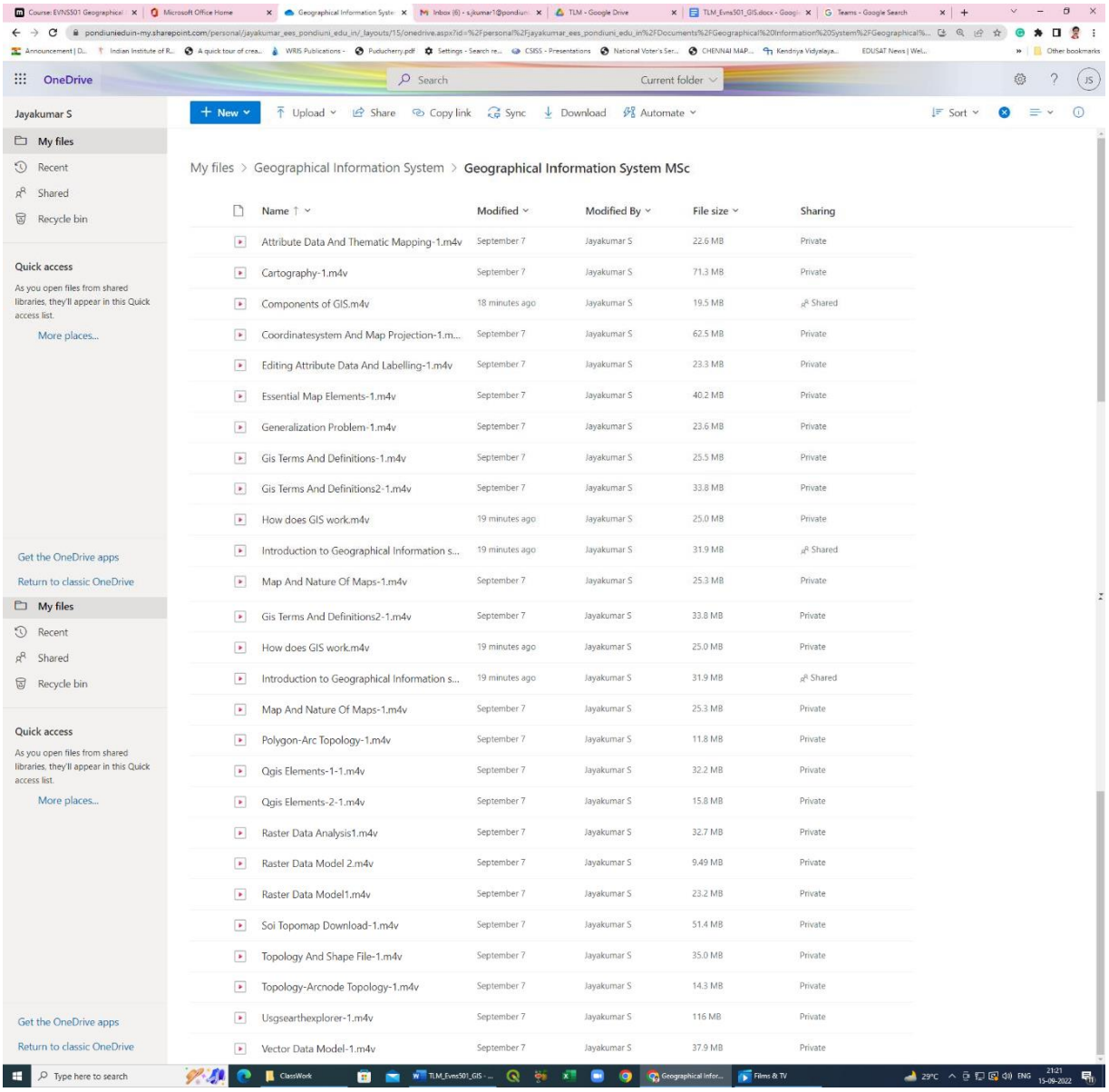
Video Lectures stored in Microsoft One drive



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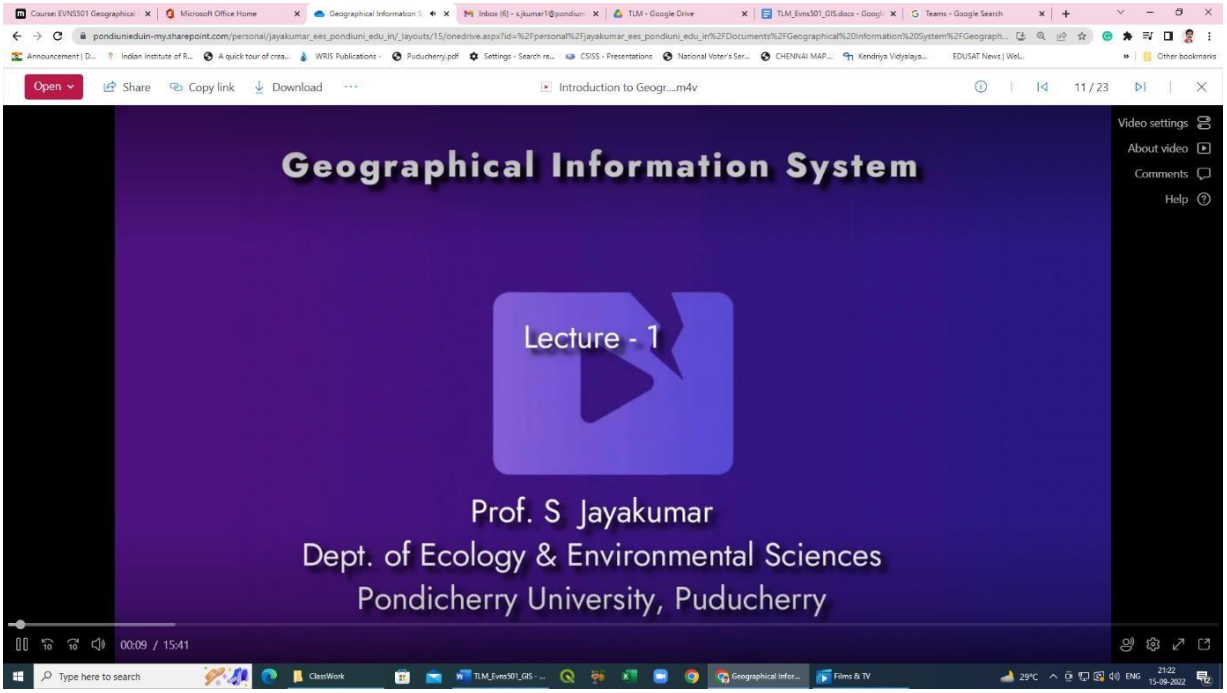
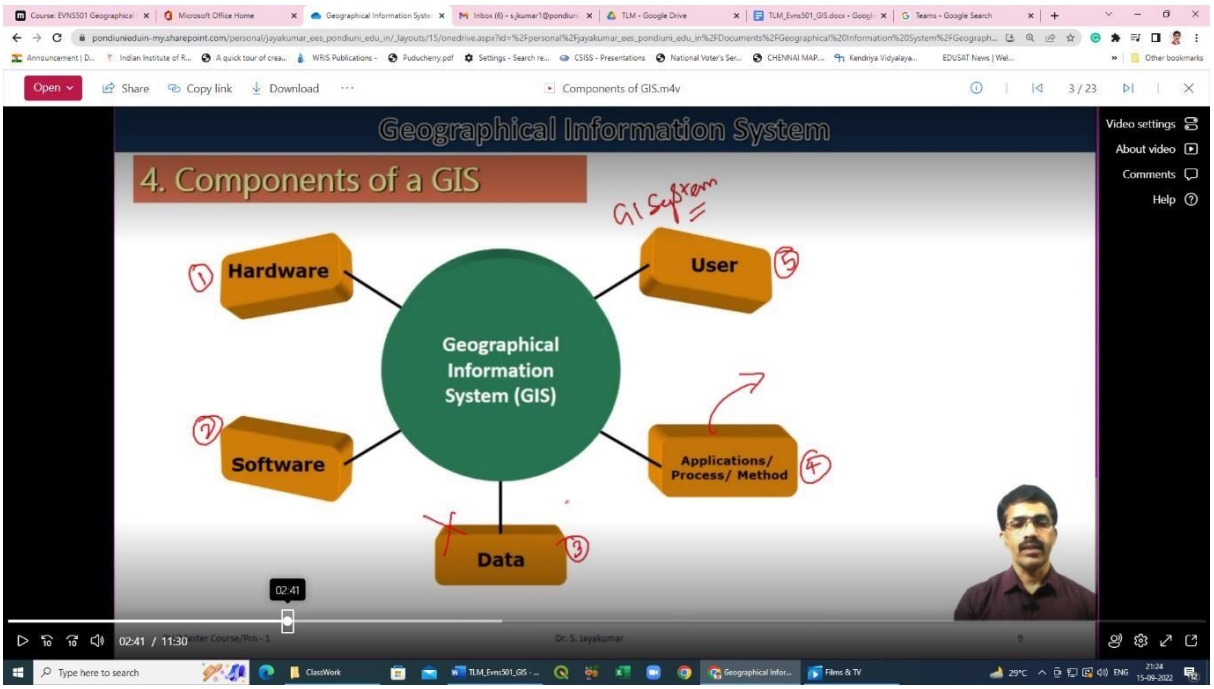
Glimpse of Video Lectures: Introduction to Geographical Information System



Components of GIS



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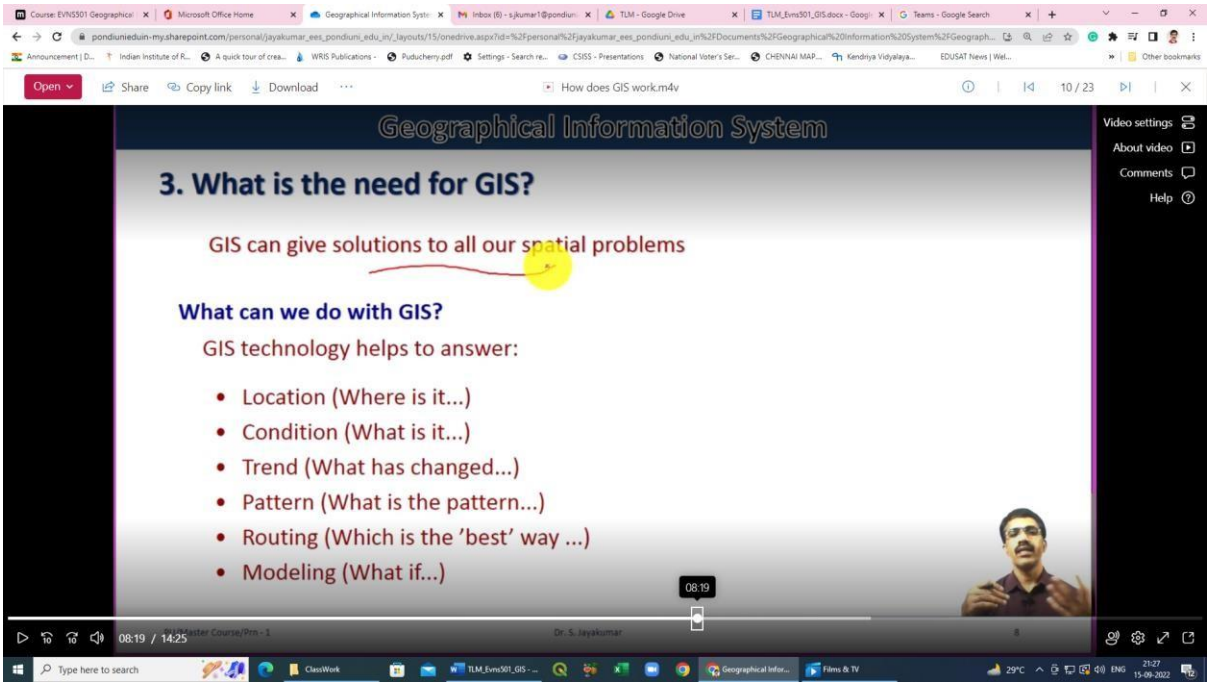
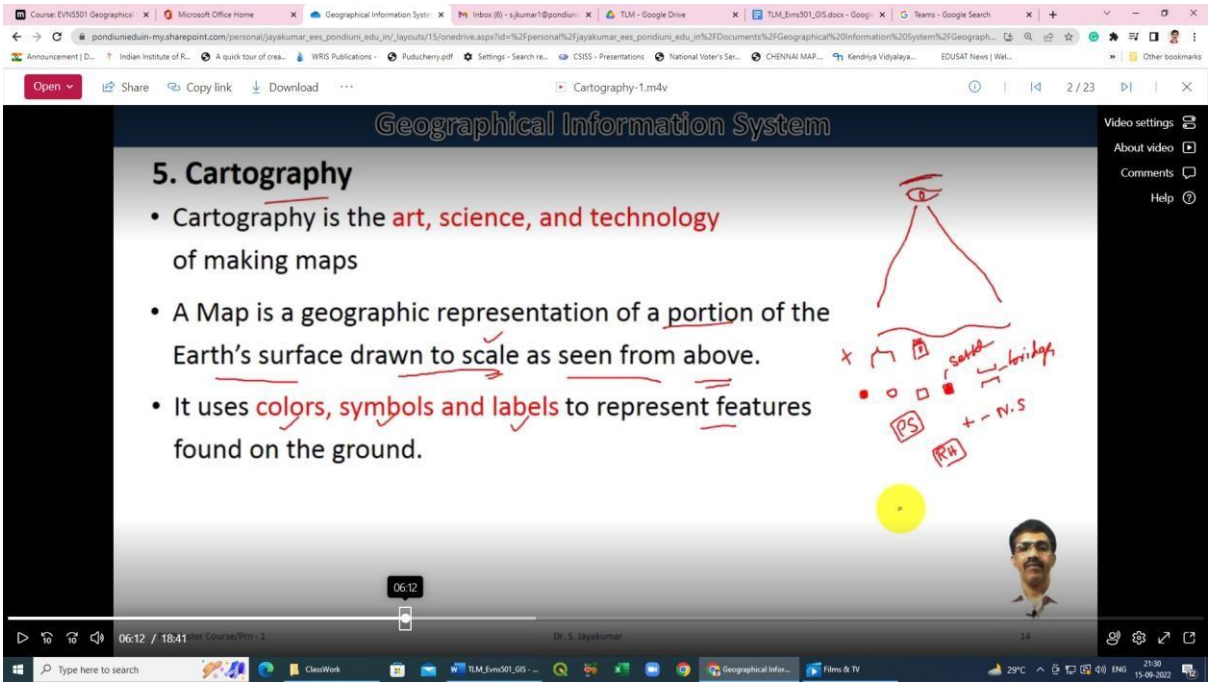
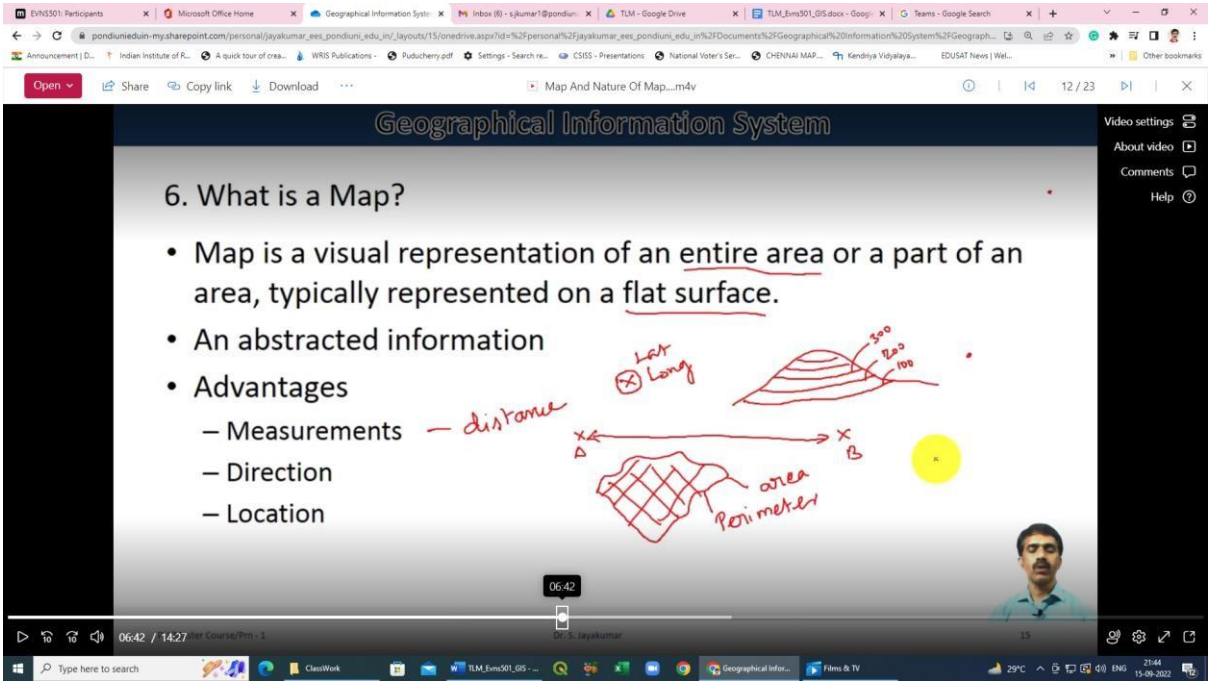
Need for GIS



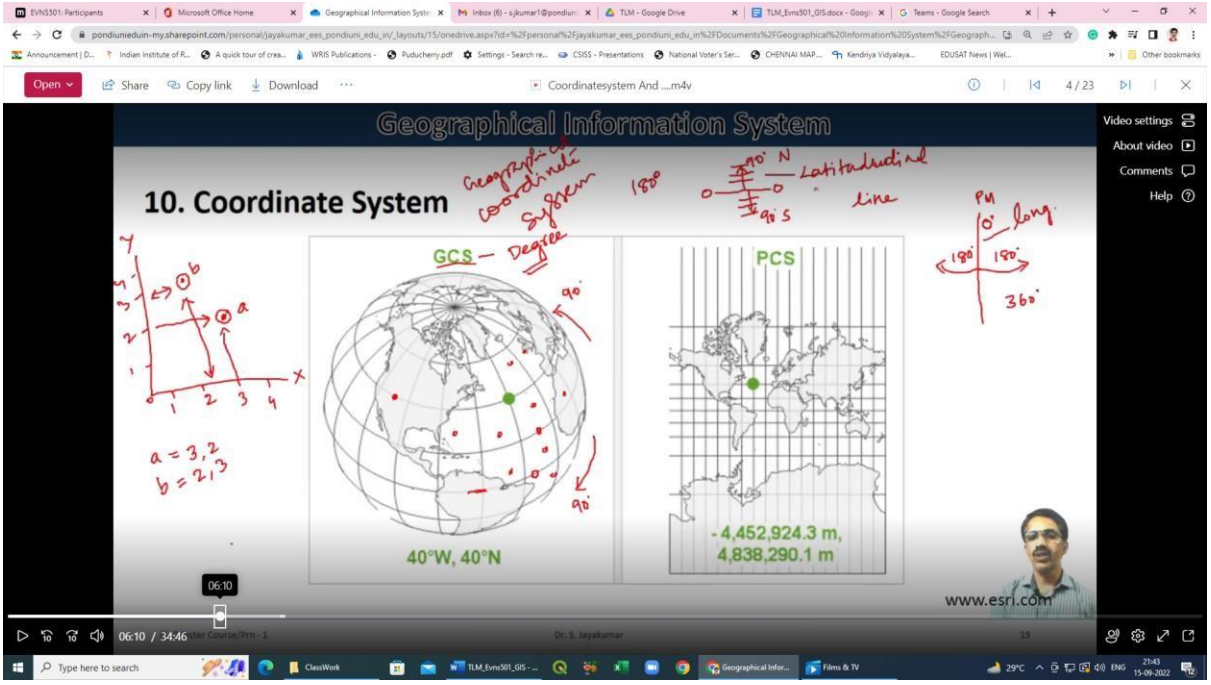
Cartography



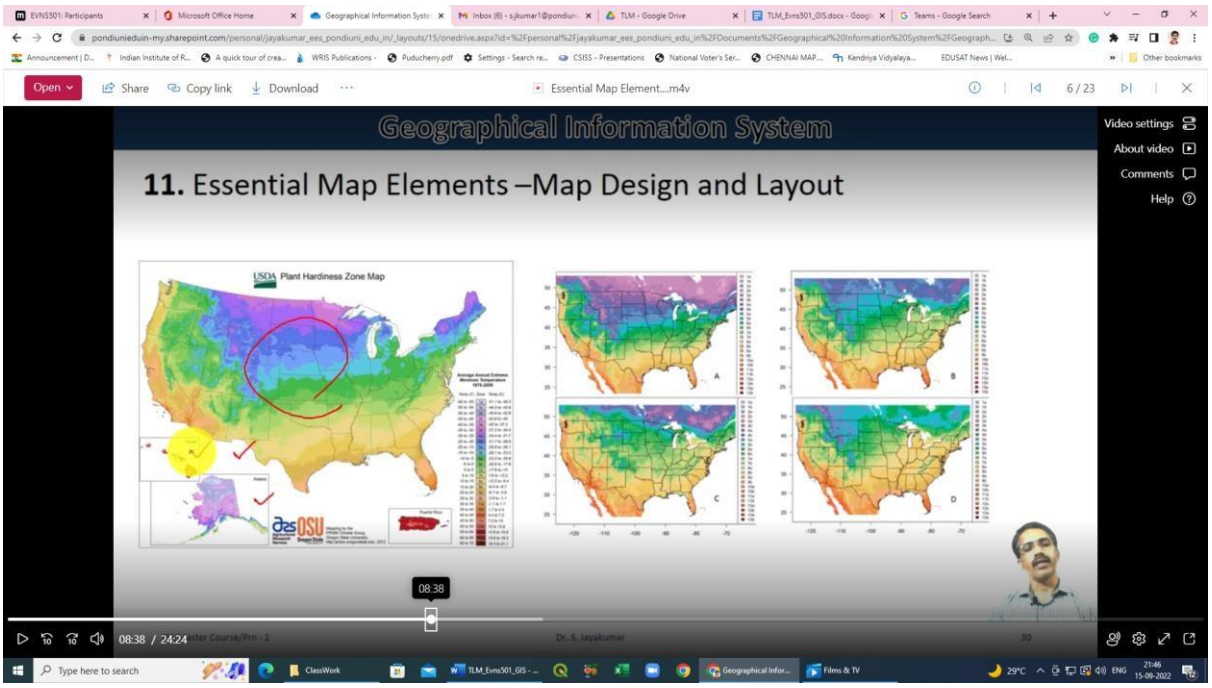
Nature of Maps



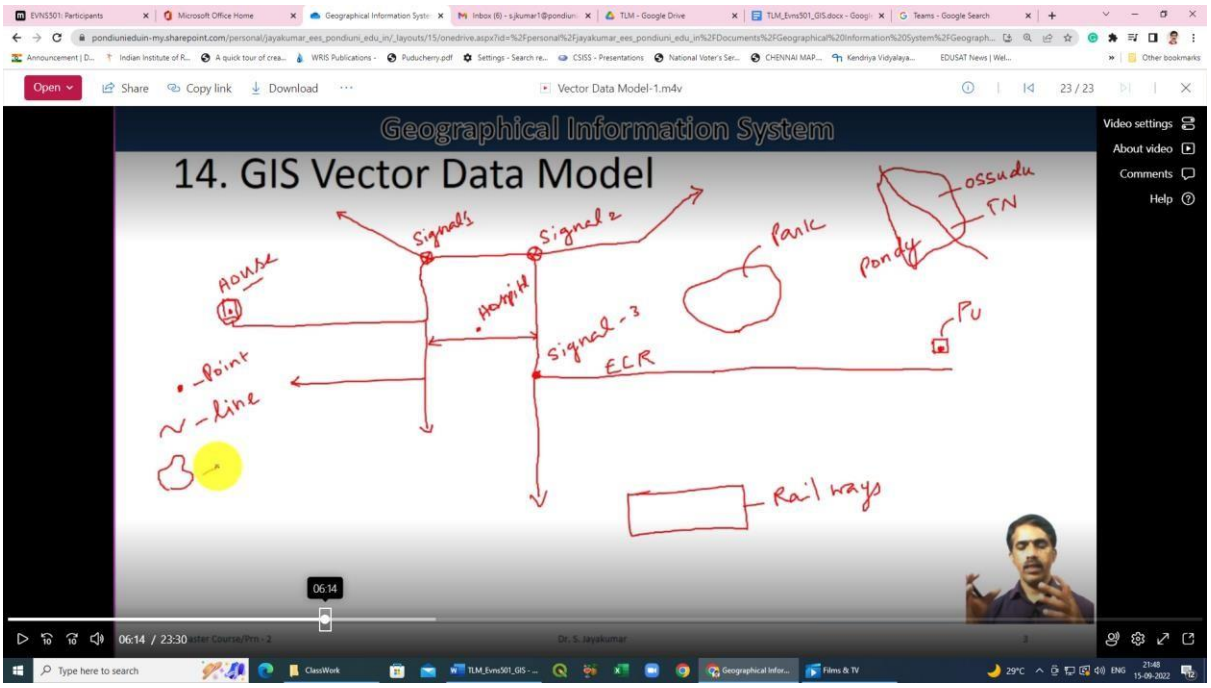
Coordinate System



Essential Map elements



Vector Data Model



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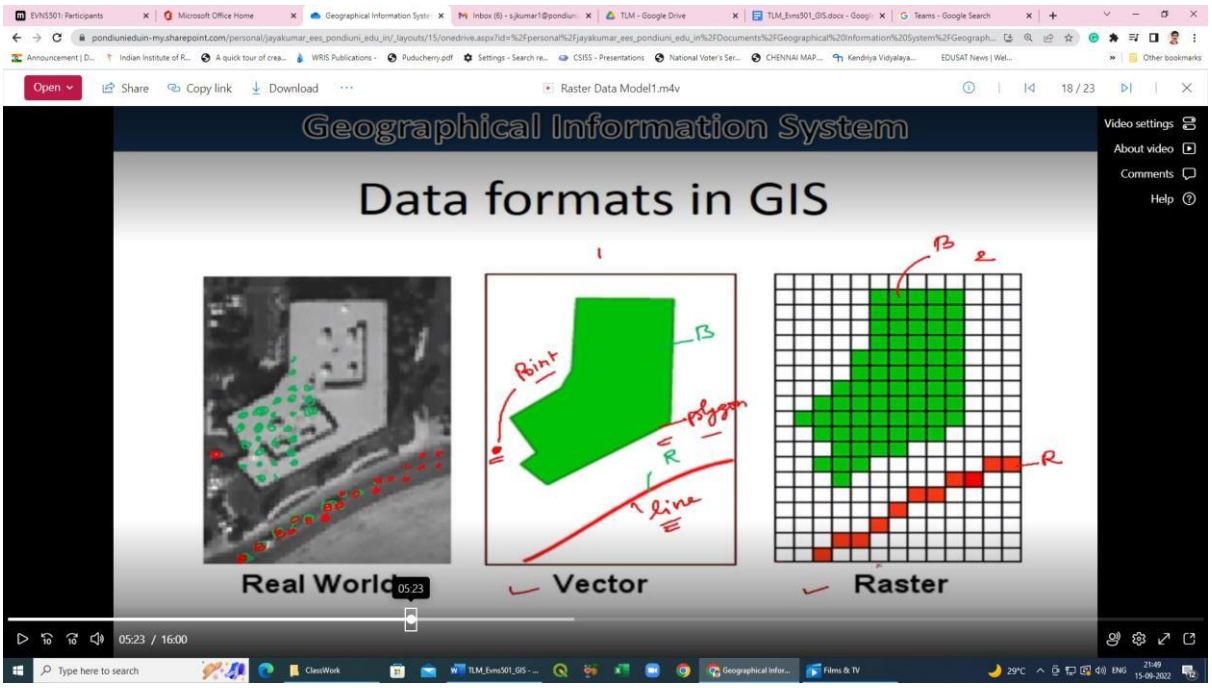
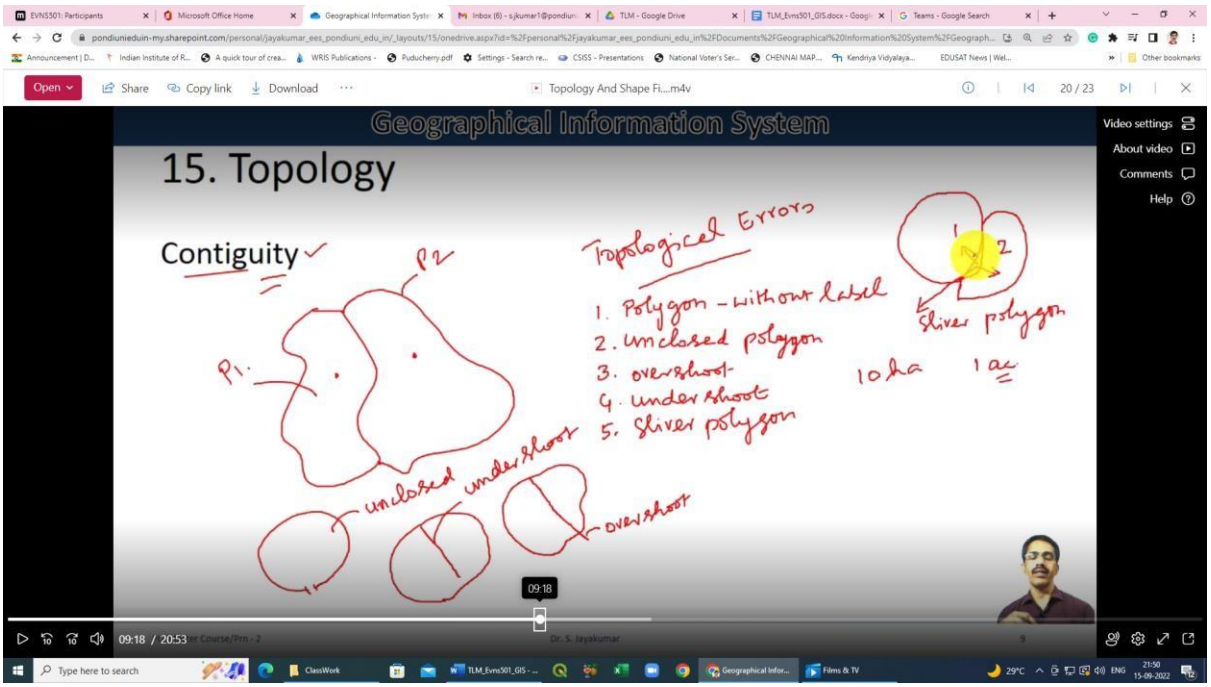
Raster data formats



Topology



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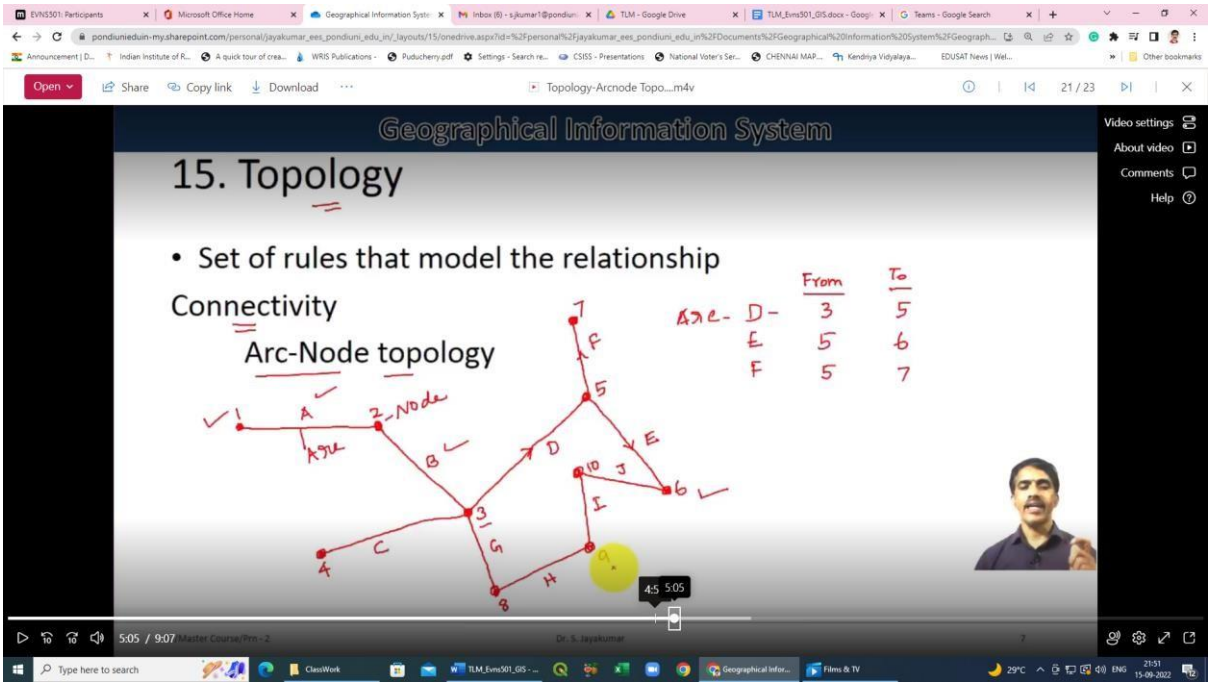
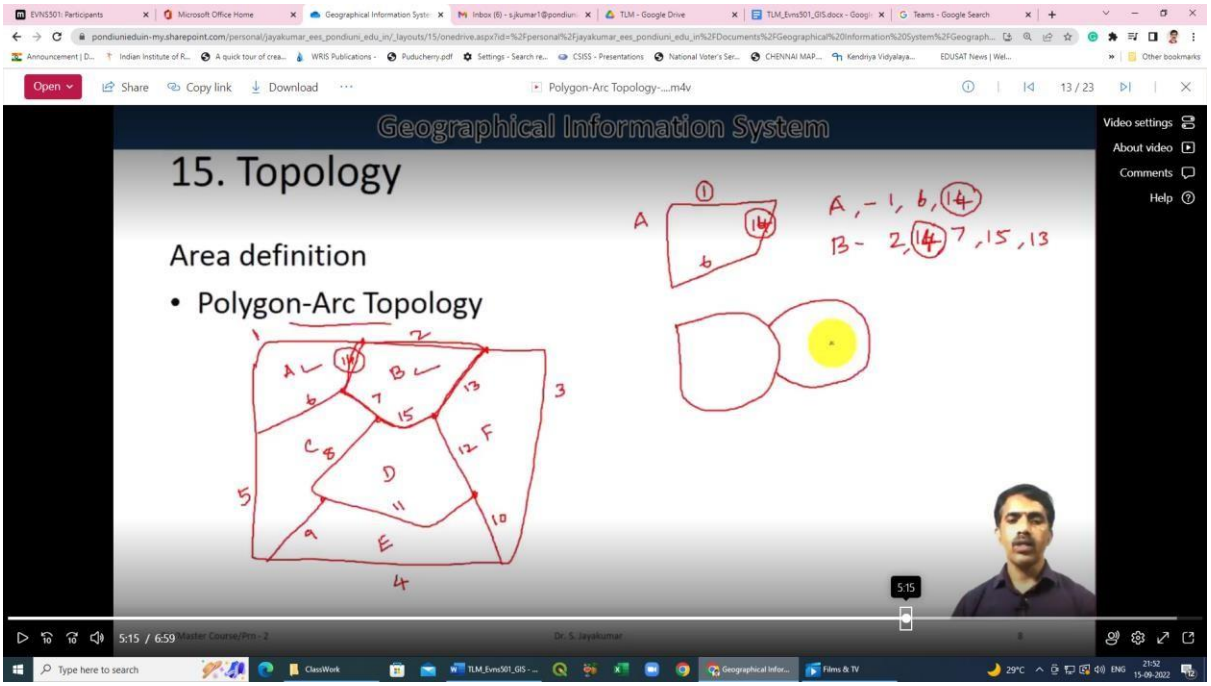
Arc-Node topology



Polygon-arc topology



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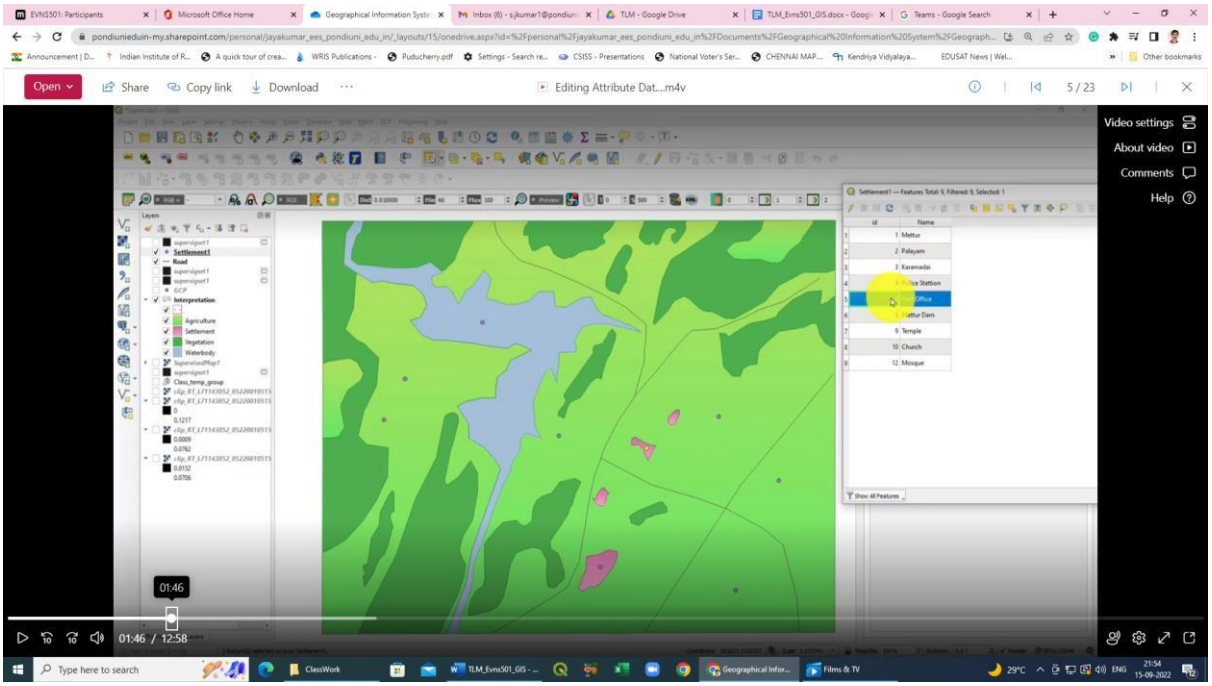
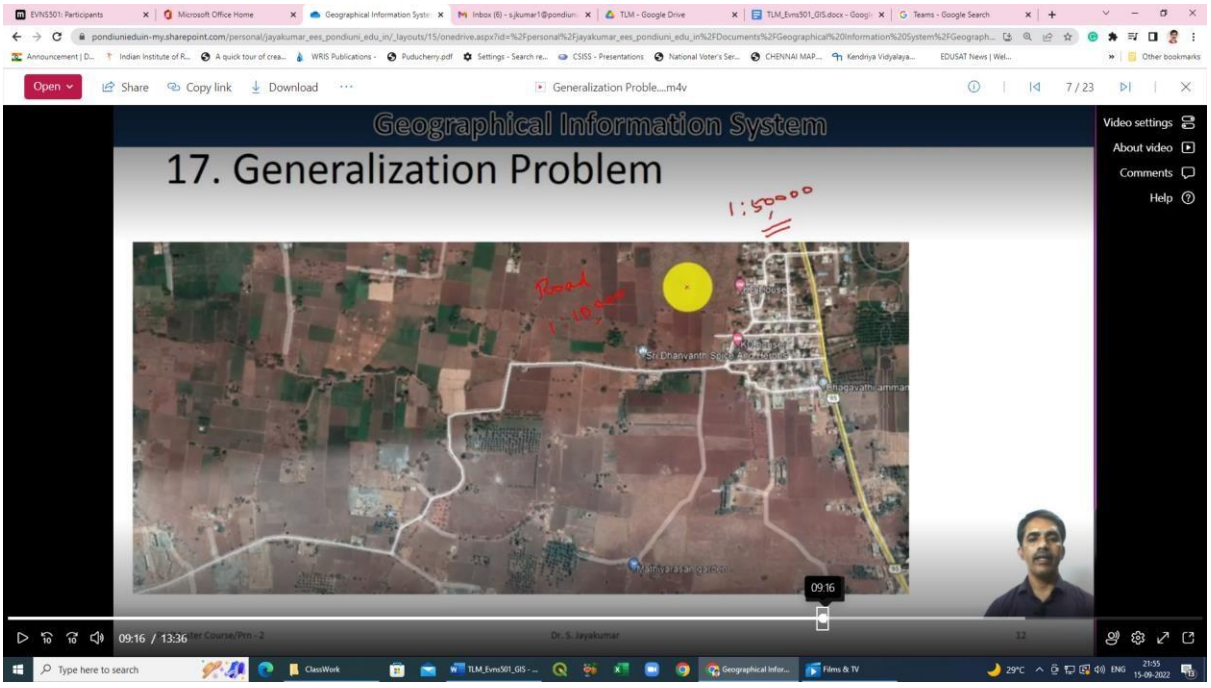
Editing Attributes



Generalization problem



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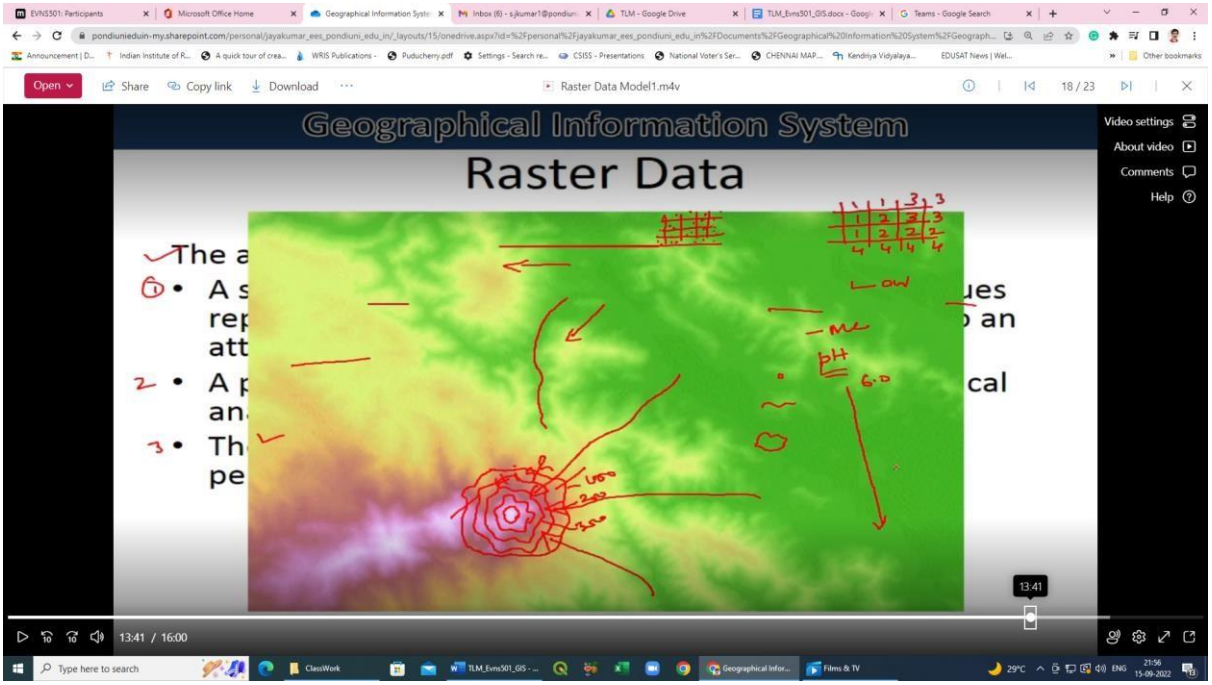
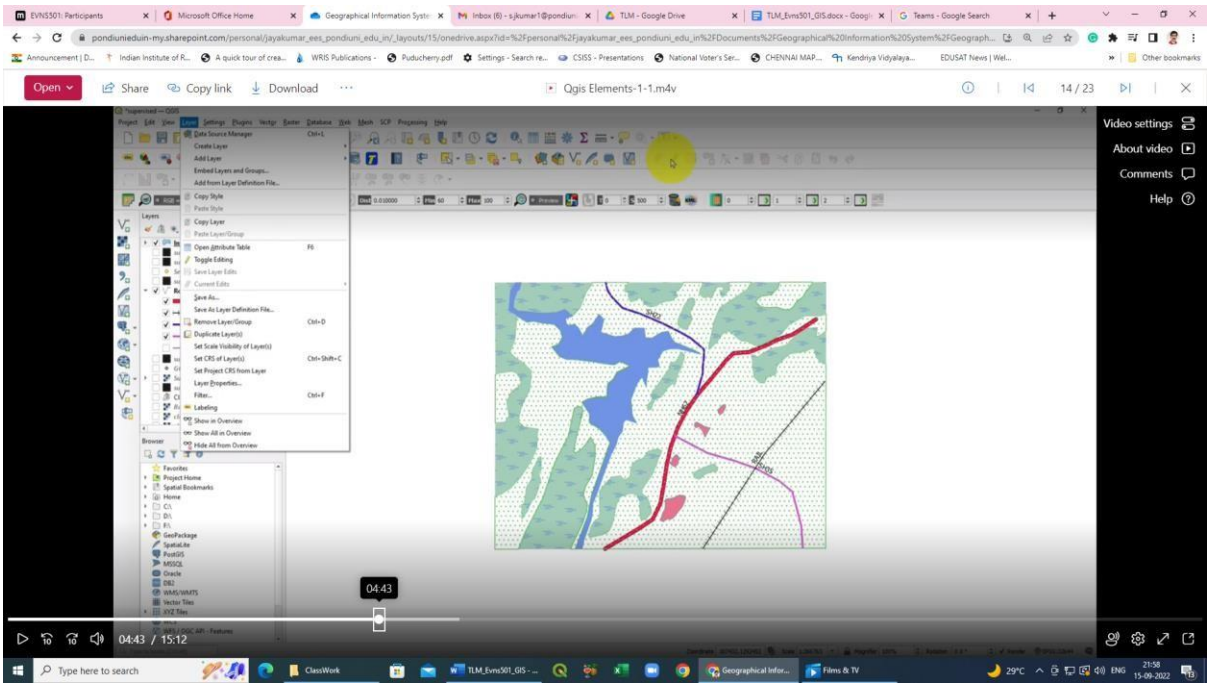
Raster Data Model



QGIS elements



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5. Course structure

5.c. In-class discussion

The in-class discussion will focus on how to approach environmental problems spatially and distinguish the factors responsible for the problems

5.d. In-class assignments & field assignment

Understanding various national and international environmental issues in urban and rural areas, preparedness for field study, data quality standards, various methods and procedures available

5.e. Reading and discussion of assigned papers for seminars

Understanding the environmental problem, debate the novel approach in the methodology, need for such studies, data and tools utilized.

5.f. Group project presentation

Ability to make presentation, effective communication, critical interpretation of data, response to audience

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6. Course Assessment

Type of assessment	Percentage of Marks
In-class discussion	5
Assignment	5
Seminars	10
Group projects	10
Internal assessment test (MCQ types)	10
Final assessment	60
Total	**100**

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7. References

1. Chang, KT, 2017, Introduction to Geographic Information Systems, McGraw Hill Education 4th Editon.
2. Robinson, AH, Morrison, JL, Muehrcke, PC, Kimerling, AJ, Guptill, SC, 2009, Elements of Cartogrphy, 6th Edition, Wiley Publication.
3. Husain, M, 2014, Evolution of Geographical Thought, Rawat Publishing house.
4. Hands-On Geospatial Analysis with R and QGIS https://www.packtpub.com/application-development/hands- geospatial-analysis-r-and-qgis Author: Shammunul Islam Date: November 2018
5. QGIS Tutorials and Tips, downloadable from https://www.qgistutorials.com/en/

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