SMRJ Government College, Siwani (Bhiwani)

(Affiliated to Chaudhary Bansi Lal University, Bhiwani)

Session: 2025-2026

Lesson Plan

(Department of Geography)

Teacher: Dr. Mukesh Kumar
Class: M.Sc
Semester: III
Maximum Marks: 100
End Term Exam Marks: 80

Course Type & Title: Environmental Geography
Course Code: 19GEO305
Credits: 04
Internal Assessment Marks: 20
Practical Marks: ----

Course Outcomes:

- **This course aims to provide the understanding about the importance of biodiversity to maintain ecological balance and various environmental issues at national and international level.**

Sr. No.	Week/Month, 2025	Unit/ Topic/ Chapter to be covered	Assignment/Test/ Remarks, if any
1	01.08.2025 – 02.08.2025	Familiar with syllabus Environment Geography and its scope.	
2	04.08.2025 – 09.08.2025	Basic Principles of Environmental Geography: Composition and types of Environment,	
3	12.08.2025 – 16.08.2025	Ecological Principles, Man – Environment relationship, Restoration of Ecology.	
4	18.08.2025 – 23.08.2025	Ecosystem: Concept and components,	
5	25.08.2025 – 30.08.2025	Trophic levels, Food chains and food webs,	**Assignment**
6	01.09.2025 – 06.09.2025	Energy flow in the ecosystem, Ecosystem stability,	**Test**
7	08.09.2025 – 13.09.2025	high land – low land interactive system, human ecological adaptation.	
8	15.09.2025 – 20.09.2025	Concept of ecosystem, Environmental Degradation, Environmental Pollution (Air)	
9	22.09.2025 – 27.09.2025	Environmental Pollution (Water and Solid Waste), Ganga Pollution & Ganga action Plan,.	
10	29.09.2025 – 04.10.2025	Environmental Problems – Global Warming, Ozone Depletion and Green house effects, transformation of nature by man,	
11	06.10.2025 – 11.10.2025	Global ecological imbalances, wetland ecosystem with reference to Haryana	
12	13.10.2025 – 18.10.2025	Environmental Management: Concept and approaches: Ecosystem Management Strategies.	

13	27.10.2025 – 01.11.2025	Environmental Dimension in Planning – Sustainable Development, Eco- Development, Limits to growth,	
14	03.11.2025 – 08.11.2025	Environmental Consciousness, National Environmental Policies and Programmes.	
15	10.11.2025 – 15.11.2025	Environmental Impact assessment, Rio Summit, Kyoto Protocol.	**Assignment**
16	17.11.2025 – 22.11.2025	Environmental Impact assessment, Carbon Trading, Paris climate summit and environmental footprints.	**Test**
17	24.11.2025 – 29.11.2025	**Seminar**	

Recommended Books/ E resources/ LMS

- Singh, L.R. et al. (1983) Environmental Management, Allahabad Geographical Society, Allahabad.
- Arvil, R. (1983) Man and the Environment. Penguin Books.
- Singh, S. (2015) Environmental Geography.Pravalika Publications, Allahabad.
- Detwler, T.R. (1971) Man's impact on the Environment. McGraw Hill, New York
- Adans, W.M. (2001) Green Development: Environment and Sustainability in the Third World. Routledge, London.

Signature of the teacher concerned

Head of the Department

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Session: 2025-2026

Lesson Plan

(Department of Geography)

Teacher: Mukesh Kumar
Class: M.Sc
Semester: III
Maximum Marks: 100
End Term Exam Marks: 80

Course Type & Title: Fundamentals of Remote Sensing
Course Code: 19 GEO 309
Credits: 04
Internal Assessment Marks: 20
Practical Marks: -------

Course Outcomes:

The aim of this course is to:

- Disseminate basic concepts and applications of Electromagnetic Spectrum in Remote Sensing, Energy Balance and Data acquisition platforms, sensors and their characteristics.
- Enhance student's knowledge about optical, thermal and microwaves based Remote Sensing and Applications for solving real life problems.
- Introduce students to digital image processing tools and techniques.

Sr. No.	Week/Month, 2025	Unit/ Topic/ Chapter to be covered	Assignment/Test/ Remarks, if any
1	01.08.2025 – 02.08.2025	Familiar with syllabus. Remote Sensing: History & Development.	
2	04.08.2025 – 09.08.2025	Remote Sensing: Definition, Concept & Principles, Electromagnetic Radiation (EMR) and Its Characteristics.	
3	12.08.2025 – 16.08.2025	EMR Wavelength Regions and their Significance.	
4	18.08.2025 – 23.08.2025	Interaction of EMR with Atmosphere Absorption, Reflectance and Scattering, Atmospheric Windows, Energy Balance Equation.	
5	25.08.2025 – 30.08.2025	Interaction of EMR with Earth's Surface: Absorption, Reflectance and Scattering, Energy Balance Equation.	
6	01.09.2025 – 06.09.2025	Imaging and Non-Imaging, Active and Passive, Multispectral, Superspectral and Hyperspectral Sensors,	
7	08.09.2025 – 13.09.2025	Electro-Optical Systems, Opto-Mechanical Scanners, Infrared Scanners, Scatterometer,	**Assignment**
8	15.09.2025 – 20.09.2025	Thermal Properties of Terrain, Thermal IR Environmental Considerations, Thermal Infrared and Thermal Scanners,	**Test**
9	22.09.2025 – 27.09.2025	Microwave Remote sensing concepts: Backscattering,	

		Range Direction, Azimuth Direction, Incident Angle,	
10	29.09.2025 – 04.10.2025	Microwave Remote sensing concepts: Depression Angle, Polarization, Dielectric Properties, Surface Roughness and Interpretation, Speckle and Its Reduction.	
11	06.10.2025 – 11.10.2025	Applications of optical, thermal and microwave remote sensing..	
12	13.10.2025 – 18.10.2025	Concepts about digital image and its characteristics, Sources of image degradation - Image restoration and Noise Abatement , Radiometric and Geometric correction technique,	
13	27.10.2025 – 01.11.2025	linear and non linear transformation for geometric corrections, Look-up Tables (LUT) and Types of image displays and FCC, Radiometric enhancement techniques, Spatial enhancement techniques,	
14	03.11.2025 – 08.11.2025	Contrast stretching: Linear and non-linear methods, Low Pass Filtering: Image smoothing, High Pass Filtering: Edge enhancement and Edge detection, Gradient filters, Directional and non-directional filtering.	
15	10.11.2025 – 15.11.2025	Concept of Pattern Recognition, Multi-spectral pattern recognition, Spectral discrimination, Signature bank, Parametric and Non-Parametric classifiers, Unsupervised classification methods, Supervised classification techniques, Limitations of standard classifiers.	
16	17.11.2025 – 22.11.2025	Parametric and Non-Parametric classifiers, Unsupervised classification methods.	**Assignment**
17	24.11.2025 – 29.11.2025	Supervised classification techniques, Limitations of standard classifiers.	**Test**

Recommended Books/ E resources/ LMS

- *Aggarwal, C.S. And Garg, P. K. (2000) Remote Sensing. A.H. Wheeler & Co. Ltd, New Delhi.*
- *Campbell, J. B. (2002) Introduction to Remote Sensing. 3rd ed., Taylor & Francis, New York, USA.*
- *Jensen, J.R. (1996). Introductory Digital Image processing a remote sensing perspective. Prentice Hall Seies in GIS , USA*
- *Bhatta, B. (2010). Remote Sensing and GIS. New Delhi: Oxford University Press.*
- *Chaunial, D. D. (2004). Remote Sensing and Geographical Information System. Allahabad: Sharda Pustak Bhawan.*
- *Nag, P. (1992). Thematic Cartography and Remote Sensing. New Delhi: Concept Publishing Company.*
- *Rampal, K.K. (1999). Handbook of Aerial Photography and Interpretation. New Delhi: Concept Publishing Company.*

Signature of the teacher concerned

Head of the Department

SMRJ Government College, Siwani (Bhiwani)

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Session: 2025-26

Lesson Plan

(Department of Geography)

Teacher: Mukesh Kumar
Class: Geo. Hons.
Semester: V
Maximum Marks: 100
End Term Exam Marks: 80

Course Type & Title: Fundamentals of Remote Sensing
Course Code: 21 UGEOH 501
Credits: 04
Internal Assessment Marks: 20
Practical Marks: --------

Course Outcomes:

- **Main objective of this course is to understand the satellite images and aerial photographs and their application in different field.**

Sr. No.	Week/Month, 2025	Unit/ Topic/ Chapter to be covered	Assignment/Test/ Remarks, if any
1	01.08.2025 – 02.08.2025	Familiars with syllabus, Remote Sensing: History; Concepts and Principles of Remote Sensing	
2	04.08.2025 – 09.08.2025	Remote Sensing: History; Concepts and Principles of Remote Sensing	
3	12.08.2025 – 16.08.2025	Classification of RS Satellites, Sensors and Platforms	
4	18.08.2025 – 23.08.2025	EMR Interaction with Atmosphere	
5	25.08.2025 – 30.08.2025	EMR Interaction with Earth Surface,	Assignment
6	01.09.2025 – 06.09.2025	Sensor Resolutions and their Applications	Class Test
7	08.09.2025 – 13.09.2025	History and Development of Photogrammetry;	
8	15.09.2025 – 20.09.2025	Acquisition, Types and Geometry of Aerial Photographs and their Applications.	
9	22.09.2025 – 27.09.2025	Comparison between Aerial Photographs and Satellite Images	
10	29.09.2025 – 04.10.2025	Image Interpretation: Principles of False Colour Composites (FCC)	
11	06.10.2025 – 11.10.2025	Image Interpretation: Principles of False Colour Composites (FCC),	
12	13.10.2025 – 18.10.2025	Elements of Image Interpretation	Assignment
13	27.10.2025 – 01.11.2025	Image Processing, Pre-processing; Enhancement Techniques.	Class Test
14	03.11.2025 – 08.11.2025	Image Classification Techniques: Supervised.	

15	10.11.2025 – 15.11.2025	Image Classification Techniques: Unsupervised and Object-based Image Analysis.	
16	17.11.2025 – 22.11.2025	Application of Remote sensing in Different Field of Geography	
17	24.11.2025 – 29.11.2025	**Seminar**	

Recommended Books/ E resources/ LMS:

- Bhatta, B. (2010). *Remote Sensing and GIS*. New Delhi: Oxford University Press.
- Chaunial, D. D. (2004). *Remote Sensing and Geographical Information System.* Allahabad: Sharda Pustak Bhawan.
- Nag, P. (1992). *Thematic Cartography and Remote Sensing.* New Delhi: Concept Publishing Company.
- Rampal, K.K. (1999). *Handbook of Aerial Photography and Interpretation.* New Delhi: Concept Publishing Company.
- Campbell, J. B. (2002). *Introduction to Remote Sensing*. London: Taylor & Francis.

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Session: 2025-26

Lesson Plan

(Department of Geography)

Teacher: Mukesh Kumar
Class: Geo. Hons.
Semester: V
Maximum Marks: 100
End Term Exam Marks: 80

Course Type & Title: Remote Sensing (Practical)
Course Code: 21UGEOH511
Credits: 04
Internal Assessment Marks: 20
Practical Marks: 80

Course Outcomes:

- **Main aim of this course is to familiarize the students with basic understanding of basic remote sensing techniques.**

Sr. No.	Week/Month, 2025	Unit/ Topic/ Chapter to be covered	Assignment/Test/ Remarks, if any
1	01.08.2025 – 02.08.2025	Familiar with Syllabus Satellite Image: An Introduction	
2	04.08.2025 – 09.08.2025	Resolution (Spatial, Spectral and Temporal)	
3	12.08.2025 – 16.08.2025	Spectral Signature Layer Stacking (LS)	
4	18.08.2025 – 23.08.2025	Band Combination True Color Combination (TCC)	
5	25.08.2025 – 30.08.2025	Band Combination False Color Combination (FCC)	Assignment
6	01.09.2025 – 06.09.2025	Pre-Processing of Satellite Data Merge and Subset of Satellite Images	
7	08.09.2025 – 13.09.2025	Image Rectification	
8	15.09.2025 – 20.09.2025	Radiometric Correction	
9	22.09.2025 – 27.09.2025	Geometric Correction	
10	29.09.2025 – 04.10.2025	Image Enhancement Techniques	
11	06.10.2025 – 11.10.2025	Satellite Image Classification Indices (NDVI, NDWI, NDSI) Unsupervised Classification	
12	13.10.2025 – 18.10.2025	Satellite Image Classification Indices (NDVI, NDWI, NDSI)	

		Unsupervised Classification	
13	27.10.2025 – 01.11.2025	Satellite Image Classification Indices (NDVI, NDWI, NDSI) Supervised Classification	
14	03.11.2025 – 08.11.2025	Satellite Image Classification Indices (NDVI, NDWI, NDSI) Supervised Classification	
15	10.11.2025 – 15.11.2025	Change Detection	
16	17.11.2025 – 22.11.2025	Change Detection Accuracy Assessment	Assignment
17	24.11.2025 – 29.11.2025	Accuracy Assessment	Class Test

Recommended Books/ E resources/ LMS:

- QGIS
- ERDAS IMAGINE
- Arc GIS
- Nag, P. (1992). *Thematic Cartography and Remote Sensing*. New Delhi: Concept Publishing Company.

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Session: 2025-26

Lesson Plan

(Department of Geography)

Teacher: Mukesh Kumar
Class: B.A.
Semester: V
Maximum Marks: 75
End Term Exam Marks: 60

Course Type & Title: Environment Geography
Course Code: 20 UGEO 502
Credits: 04
Internal Assessment Marks: 15
Practical Marks: ---

Course Outcomes:

Main outcomes of this course are to develop the basic understanding of environmental processes and man environment relationship, contemporary issues and their importance for mankind.

Sr. No.	Week/Month, 2025	Unit/ Topic/ Chapter to be covered	Assignment/Test/ Remarks, if any
1	01.08.2025 – 02.08.2025	Familiar with syllabus.	
2	04.08.2025 – 09.08.2025	Nature & Scope of Environmental Geography.	
3	12.08.2025 – 16.08.2025	Basic Principles of Environmental Geography.	
4	18.08.2025 – 23.08.2025	Approaches to Study Environmental Geography; Composition and Type of Environment.	
5	25.08.2025 – 30.08.2025	Approaches to Study Environmental Geography - Man-environment Relationship.	
6	01.09.2025 – 06.09.2025	Ecosystem: Concept and Components.	
7	08.09.2025 – 13.09.2025	Food Chain and Food Webs,	
8	15.09.2025 – 20.09.2025	Trophic Structure, Ecological Pyramids,	Assignment
9	22.09.2025 – 27.09.2025	Energy Flow and Bio-geo Chemical Cycles	Class Test
10	29.09.2025 – 04.10.2025	Environmental Degradation: Concept, Meanings and their Types; Greenhouse Effect, Global Warming,	
11	06.10.2025 – 11.10.2025	Environmental Pollution: Meaning and Types; Impact of Air, Water and Land Pollutions	
12	13.10.2025 – 18.10.2025	Environmental Pollution: Meaning and Types; Impact of Air, Water and Land Pollutions	
13	27.10.2025 – 01.11.2025	Environmental Pollution: Meaning and Types; Impact of	

		Air, Water and Land Pollutions	
14	03.11.2025 – 08.11.2025	Environmental Management: Concepts and Approaches,	
15	10.11.2025 – 15.11.2025	Environmental Issues, Awareness and Movements in India,	
16	17.11.2025 – 22.11.2025	Environmental Management in India; Various Environmental Summits	Assignment
17	24.11.2025 – 29.11.2025	Environmental Management in India; Various Environmental Summits	Class Test

Recommended Books/ E resources/ LMS:

- जोशी, आर. (2020). पयादवरण भूगोल. आगरा: सादहत्य भवन प्रकाशन.
- सक्सेना,एच.एम.,सक्सेना, आर.,औरसक्सेना,पी. (2020). पयादवरण भूगोल .जयपुर:रावतप्रकाशन.
- हुसैन,एम. (2020).पयादवरण एवं पाररजस्थततकी. (5वां संस्करण).नईददल्ली:जी.के.पजललके शनप्रा.सलसमटेड.
- Casper, J. K. (2010). *Changing ecosystems: Effects of global warming*. New York: InfobasePub.
- Hudson, T. (2011). *Living with Earth: An introduction to environmental geology* New Delhi: PHI Learning Private Limited.

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Session: 2025-26

Lesson Plan

(Department of Geography)

Teacher: Mukesh Kumar
Class: B.A
Semester: V
Maximum Marks: 25
End Term Exam Marks: 25

Course Type & Title: Remote Sensing & GIS (P)
Course Code: Practical
Credits: 04
Internal Assessment Marks: ---
Practical Marks: 25

Course Outcomes:

- Main objective of this course is to enrich the students with basic understanding of aerial photographs and satellite imagery. It also aims to provide hands on training on GIS software and map making and application of GPS & TS in mapping.

Sr. No.	Week/Month, 2025	Unit/ Topic/ Chapter to be covered	Assignment/Test/ Remarks, if any
1	01.08.2025 – 02.08.2025	**Familiar with syllabus & Software.**	
2	04.08.2025 – 09.08.2025	Remote Sensing: Working Principles.	
3	12.08.2025 – 16.08.2025	Remote Sensing: Working Principles.	
4	18.08.2025 – 23.08.2025	Basic Characteristics and Interpretation of Aerial Photographs.	
5	25.08.2025 – 30.08.2025	Basic Characteristics and Interpretation of Aerial Photographs.	
6	01.09.2025 – 06.09.2025	Identification and Interpretation of various features on Satellite Images	
7	08.09.2025 – 13.09.2025	Identification and Interpretation of various features on Satellite Images	
8	15.09.2025 – 20.09.2025	GIS: Geo-referencing	
9	22.09.2025 – 27.09.2025	GIS: Geo-referencing	
10	29.09.2025 – 04.10.2025	Digitization.	Assignment
11	06.10.2025 – 11.10.2025	Digitization.	Class Test
12	13.10.2025 – 18.10.2025	Layout map,	
13	27.10.2025 – 01.11.2025	Map making and Choropleth Maps.	
14	03.11.2025 – 08.11.2025	Mapping with GPS Global Positing System) and Total Station (TS).	
15	10.11.2025 – 15.11.2025	Mapping with GPS Global Positing System) and Total Station (TS).	

16	17.11.2025 – 22.11.2025	Assignment	
17	24.11.2025 – 29.11.2025	Class Test	

Recommended Books/ E resources/ LMS:

- QGIS
- ERDAS IMAGINE
- Arc GIS
- Nag, P. (1992). *Thematic Cartography and Remote Sensing.* New Delhi: Concept Publishing Company.

Signature of the teacher concerned

Head of the Department