# SECOND-YEAR OF MASTER OF ARTS MAJOR GEOGRAPHY REVISED SYLLABUS ACCORDING TO CBCS NEP2020

## COURSE TITLE: REMOTE SENSING AND GIS APPLICATIONS IN ENVIRONMENTAL MANAGEMENT SEMESTER-IV, W.E.F. 2024-2025

**RECOMMENDED BY THE BOARD OF STUDIES IN GEOGRAPHY**
**AND**
**APPROVED BY THE ACADEMIC COUNCIL**

Devrukh Shikshan Prasarak Mandal's
Nya. Tatyasaheb Athalye Arts, Ved. S. R. Sapre Commerce, and Vid. Dadasaheb Pitre Science College (Autonomous), Devrukh. Tal.Sangmeshwar. Dist. Ratnagiri-415804. Maharashtra. India

Academic Council Item No: 03

| | | |
|---|---|---|
| Name of the Implementing Institute | : | Nya. Tatyasaheb Athalye Arts, Ved. S. R. Sapre Commerce, and Vid. Dadasaheb Pitre Science College (Autonomous), Devrukh. Tal. Sangmeshwar, Dist. Ratnagiri-415804, |
| Name of the Parent University | : | University of Mumbai |
| Name of the Programme | : | Master of Arts |
| Name of the Department | : | Geography |
| Name of the Class | : | Second Year |
| Semester | : | Fourth |
| No. of Credits | : | 04 |
| Title of the Course | : | Remote Sensing and GIS Applications in Environmental Management |
| Course Code | : | A611GET |
| Name of the Vertical in adherence to NEP 2020 | : | Major |
| Eligibility for Admission | : | - |
| Passing Marks | : | 40% |
| Mode of Assessment | : | Formative and Summative |
| Level | : | PG |
| The pattern of market distribution for TE and CIA | : | 60:40 |
| Status | : | NEP-CBCS |
| To be implemented from the Academic Year | : | 2024-2025 |
| Ordinances/Regulations (if any) | | |

# Syllabus for Second Year of Master of Arts in Geography

**(With effect from the academic year 2024-2025)**

**SEMESTER-IV** **Paper No.– II**

**Course Title:** Remote Sensing and GIS Applications in Environmental Management

**No. of Credits** - 04 **Type of Vertical:** Major **COURSE CODE:** A611GET

**Learning Outcomes Based on BLOOM's Taxonomy:**

After completing the course, the learner will be able to…

| Course Learning Outcome No. | Blooms Taxonomy | Course Learning Outcome |
|---|---|---|
| CLO-01 | Remember | Remember the concepts and principles related to land use, land cover, soil analysis, vegetation analysis, and water analysis, including their respective classification schemes, resolution considerations, and biophysical characteristics. |
| CLO-02 | Understand | Understand the interrelation of land use and cover, classification schemes, resolution's impact, remote sensing/GIS for land use extraction, photosynthesis, spectral characteristics in vegetation analysis, temporal aspects, vegetation indices, soil significance, ecosystem implications, soil salinity/roughness effects, surface water characteristics, water elements' influencers, and water quality modelling principles. |
| CLO-03 | Apply | Apply land use classification, remote sensing, GIS techniques, photosynthesis fundamentals, spectral characteristics for vegetation mapping, vegetation indices for detecting forest cover changes, soil analysis techniques, and remote sensing/GIS tools for real-world water analysis and modelling. |
| CLO-04 | Analyze | Analyze resolution's impact on land use/cover, assess forest cover change with remote sensing, examine soil characteristics for variations, evaluate surface water using remote sensing, and scrutinize water quality factors through modelling. |
| CLO-05 | Evaluate | Assess land use classification schemes, evaluate forest cover change detection precision, scrutinize soil analysis reliability, and examine water analysis model accuracy for quality forecasting. |
| CLO-06 | Create | Create a tailored land use classification scheme, develop a forest cover change detection model using remote sensing data, plan soil analysis procedures for an area, and build a water quality model using remote sensing and GIS techniques. |

## Syllabus for Second Year of Master of Arts in Geography

**(With effect from the academic year 2024-2025)**

**SEMESTER-IV** **Paper No.–** II

**Course Title:** Remote Sensing and GIS Applications in Environmental Management

**No. of Credits -** 04 **Type of Vertical:** Major **COURSE CODE:** A611GET

| COURSE CONTENT | | | |
|---|---|---|---|
| **Module No.** | **Content** | **Credits** | **No. of Lectures** |
| 1 | **RS and GIS Applications in Land Use and Land Cover Analysis:**<br>o Concept of Land Use and Land Cover<br>o Land Use and Land Cover Classification Scheme<br>o Resolution Consideration for LULC analysis<br>o Application of RS and GIS for extracting different types of land uses | 01 | 15 |
| 2 | **RS and GIS Applications in Forest Cover Change Detection Analysis:**<br>o Photosynthesis Fundamentals<br>o Spectral Characteristics of Vegetation<br>o Temporal Characteristics of Vegetation<br>o Vegetation Indices | 01 | 15 |
| 3 | **RS and GIS Applications in Soil Analysis:**<br>o Soil characteristics and Taxonomy<br>o Soil Texture and moisture content<br>o Soil Organic Matter and Biological Soil Crusts<br>o Soil Salinity and Surface Roughness | 01 | 15 |
| 4 | **RS and GIS Applications in Water Analysis:**<br>o Surface water Bio-Physical Characteristics<br>o Water vapor and Precipitation<br>o Aerosols and Clouds<br>o Water Quality Modelling | 01 | 15 |
| | **Total** | **04** | **60** |

**Required Previous Knowledge**

Basic knowledge of the fundamentals of Remote Sensing is necessary to learn the course.

**Access to the Course**

The course is available for all the students admitted for Master of Arts as a Major in Geography.

**Methods of Assessment:**

The assessment pattern would be 60:40, 60% for Semester End Examination (SEE) and 40 % for Continuous Internal Assessment (CIA). The structure of the SEE and CIA is recommended by the Board of Studies and approved by the Board of Examination and the Academic Council of the college.

**Grading Scale**

The grading scale used is O to F. Grade O is the highest passing grade on the grading scale, and grade F is a fail. The Board of Examinations of the college reserves the right to change the grading scale.

**Reference books: -**


1. John R. Jensen (2011): Remote Sensing of the Environment. Pearson
2. Cambell, J. B. (2002): 'Introduction to Remote Sensing', Taylor & Francis, UK.
3. Gibson, P. J. (2000): 'Introduction to Remote Sensing - Digital Image Processing and Applications', Routledge - Taylor & Francis.
4. Gibson, P. J. (2000): 'Introduction to Remote Sensing - Principles and Concepts', Routledge - Taylor & Francis.
5. Gonzalez, R. C. and Wintz, P. (2010): Digital Image Processing, Prentice Hall, Upper Saddle River, New Jersey.
6. Jain, A. K. (2012): Fundamentals of Digital Image Processing, Prentice Hall, Information and System Sciences Series, Kailath, T. (Series Ed.).
7. Lilles and T. M. and. Kiefer, R. W. (2015): 'Remote Sensing and Image Interpretation', John Wiley & Sons, Singapore.
8. Pratt, W. K. (2001): (3rd Ed.) Digital Image Processing John Wiley & Sons, Inc. ISBNs: 0-471-37407-5.
9. Russ, J. C. (1992): The Image Processing Handbook, CRC Press SIUE Library call #: TA1632.R88 (reference).
10. Sabins (Jr.) F. F. (1986), 'Remote Sensing - Principles and Interpretation', W. H. Freeman & Co., New York.
11. Sahu, K. C. (2008): Text Book of Remote Sensing and Geographical Information System, Atlantic Publishers and Distributors (P) Ltd., New Delhi.
12. Schowengerdt, R. A. (2006): 'Remote Sensing - Models and Methods for Image Processing', Elsevier India Pvt. Ltd., New Delhi.
13. Umbaugh, S. E. (2005): Computer Imaging: Digital Image Analysis and Processing, The CRC Press, Boca Raton, FL, January.
14. IEEE: Transactions on Image Processing
15. IEEE: Transactions on Neural Networks
16. IEEE: Transactions on Geoscience and Remote Sensing
17. Photogrammetric Engineering and Remote Sensing 19.International Journal of Remote Sensing.