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

COURSE TITLE: COURSE TITLE: TOOLS AND TECHNIQUES IN SPATIAL ANALYSIS-I
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	:	02
Title of the Course	:	Tools and Techniques in Spatial Analysis - I
Course Code	:	A613GEP
Name of the Vertical in adherence to NEP 2020	:	Major
Eligibility for Admission	:	NA
Passing Marks	:	40%
Mode of Assessment	:	Summative
Level	:	PG
Pattern of Marks Distribution for TE and CIA	:	NA
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 2023-2024)

SEMESTER-IV **Paper No.–IV**

Course Title: Tools and Techniques in Spatial Analysis-I **No. of Credits - 02**

Type of Vertical: Major **COURSE CODE:** A613GEP

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	Identify fundamental concepts of GPS, GNSS, and Total Station, including projections, datums, and surveying principles.
CLO-02	Understand	Explain the processes involved in point, line, and area demarcation using handheld GNSS, smartphone-based GNSS, and Total Station.
CLO-03	Apply	Conduct field surveys using GNSS and Total Station for spatial data collection, including geotagging and area calculations.
CLO-04	Analyse	Examine locational accuracy, assess survey data quality, and interpret spatial datasets for geographic applications.
CLO-05	Evaluate	Critically assess the efficiency of different GNSS and Total Station techniques in mapping, data acquisition, and geospatial analysis.
CLO-06	Create	

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SEMESTER-III **Paper No.–IV**

Course Title: Tools and Techniques in Spatial Analysis-III **No. of Credits - 02**

Type of Vertical: Major **COURSE CODE:** A504GEP

1. **Hand GPS Survey**
   - 1.1. Projection and Datum Defining
   - 1.2. Demarcation of Point Segment - Using Handheld GNSS
   - 1.3. Demarcation of Line Segment - Using Handheld GNSS
   - 1.4. Demarcation of Area Segment - Using Handheld GNSS
   - 1.5. Area Calculation - Using Handheld GNSS
2. **Android Mobile GPS Survey**
   - 2.1. Demarcation of Point Segment - Using Smartphone-Based GNSS
   - 2.2. Demarcation of Line Segment - Using Smartphone-Based GNSS
   - 2.3. Demarcation of Area Segment - Using Smartphone-Based GNSS
   - 2.4. Area Calculation - Using Smartphone-Based GNSS
   - 2.5. Geotagging of photographs
   - 2.6. Assessment of Locational Accuracy
   - 2.7. Preparation of a Map using GNSS segments
   - 2.8. Geodetic and Planar Survey
3. **Total Station Survey**
   - 3.1. Parts of Total Station
   - 3.2. Leveling and Prism Adjustment
   - 3.3. Open and Closed Traversing
   - 3.4. Dimension Measurements.
   - 3.5. Contouring.
   - 3.6. E-Transmittal.
   - 3.7. Block Generation.

4. **Data importing and processing in GIS:**
    4.1. Importing GPX files
    4.2. Editing Data Sets
    4.3. Data Cleaning and Attribute Attachment
    4.4. Map Layout

Required Previous Knowledge

No previous Knowledge is necessary to learn the course.

Access to the Course

The course is available for all the students admitted for Master of Arts.

Methods of Assessment:

Vocational skill Courses, Skill Enhancement Courses and courses having laboratory sessions shall be assessed at the end of each semester.

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.

References:

Books

1. Bolstad, P. (2019). *GIS Fundamentals: A First Text on Geographic Information Systems*. Eider Press.
2. Chang, K. (2016). *Introduction to Geographic Information Systems*. McGraw-Hill Education.
3. Ghilani, C. D., & Wolf, P. R. (2017). *Elementary Surveying: An Introduction to Geomatics*. Pearson.
4. Hofmann-Wellenhof, B., Lichtenegger, H., & Wasle, E. (2008). *GNSS – Global Navigation Satellite Systems: GPS, GLONASS, Galileo, and More*. Springer.
5. Seeber, G. (2003). *Satellite Geodesy*. Walter de Gruyter.
6. Van Sickle, J. (2015). *GPS for Land Surveyors*. CRC Press.
7. Kavanagh, B. F. (2009). *Surveying: Principles and Applications*. Pearson.

8. Schofield, W., & Breach, M. (2007). *Engineering Surveying*. Butterworth-Heinemann.

Research Papers & Articles

9. El-Rabbany, A. (2002). *Introduction to GPS: The Global Positioning System*. Artech House.
10. Leick, A., Rapoport, L., & Tatarnikov, D. (2015). *GPS Satellite Surveying*. John Wiley & Sons.
11. Laurila, S. H. (2001). *Electronic Surveying and GPS*. Springer.
12. Rizos, C. (2002). *Principles and Practice of GPS Surveying*. Monograph 17, University of New South Wales.

Online Resources & Manuals

13. National Oceanic and Atmospheric Administration (NOAA) – *GNSS Data Processing and Analysis* https://www.noaa.gov
14. ESRI (2023). *GPS Field Data Collection Using ArcGIS* – https://www.esri.com
15. Leica Geosystems – *Total Station and GNSS Surveying Manuals* https://leica-geosystems.com
16. Trimble Navigation – *Total Station and GNSS Reference Guides* https://www.trimble.com
17. OpenStreetMap Wiki – *Using GNSS and GPS for Mapping* https://wiki.openstreetmap.org