Course Title: Exploring Neighbourhood with Space Technology

Course	L	T	P	S	Credits
Exploring Neighbourhood with Space Technology	1	0	1	1	3

Department: Planning and Geomatics

Course Objectives:

This course introduces students to the innovative use of space technology in exploring and understanding neighborhoods. Through a combination of theoretical discussions, case studies, and hands-on projects, students will gain a comprehensive understanding of how space technology, including satellite imagery, remote sensing, and geographic information systems (GIS), can be leveraged to analyze, monitor, and improve neighborhoods.

Course Outcomes:

By the end of the course, students will be able to:

- Understand the principles of space technology and its applications in analyzing neighborhoods.
- Analyze neighborhood characteristics and dynamics using satellite imagery and remote sensing data.
- Apply Geographic Information Systems (GIS) techniques to map and visualize neighborhood features and changes.
- Evaluate the role of space technology in urban planning, community development, and environmental monitoring.

Course requirement:

- Laptop/computers
- Image Processing & GIS softwares (open source)
- Pens/pencils/sticky notes/note books
- Flip charts and markers
- Projector and microphones for group work and presentation
- Tables arranged to accommodate groups of 3-4 students
- An open mind and willingness to learn new theories and concepts

Course pedagogy:

The course will employ a variety of instructional methods and activities to enrich the learning experience, including seminar lectures, student group activities, group discussions, workshops, assignments, case studies, and student presentations. These methods are designed to accommodate diverse learning styles, foster active participation, and ensure a thorough grasp of the course material.

Seminar Lectures: Teacher-led sessions utilizing various media to present key concepts, theories, and syllabus topics.

Student Group Activities: Collaborative tasks assigned to groups to promote teamwork, problem-solving, and application of learned concepts within each course module.

Group Discussions: Opportunities for engaging students in critical conversations about theoretical topics to encourage critical thinking, idea exchange, and communication skills development.

Workshops: Practical sessions providing hands-on experience and utilization of tools and techniques related to the subject matter.

Assignments/Case Studies: Group assignments based on case studies to assess understanding of course material and provide in-depth analysis of real-world situations. Students will analyze, discuss, and propose solutions based on their comprehension of the subject matter.

Student Presentations: Opportunities for students to demonstrate their understanding of a topic through presentations to the class at the conclusion of each module. This reinforces knowledge through teaching and enhances communication skills.

Course Contents:

Module I: Introduction to Space Technology

>Overview of space technology: satellites, remote sensing, GIS; Principles of satellite imagery and remote sensing; Interpretation and analysis of satellite imagery for neighborhood exploration; Group activity: Introduce available satellite data for processing and analysis, Student-Teacher Discussions on the data analysis and interpretation. Student group presentations (10-min presentation & 10 min for discussion and Q&A).

Module II: GIS for Neighbourhood Analysis

- Mapping neighborhood features and dynamics using GIS; Overview of GIS Softwares; Google Earth and its capabilities; Spatial analysis techniques (buffering, overlay, proximity analysis), Data collection using GPS; Group activity: Introduce students to different case studies, identify gaps, challenges & opportunities; Student-Teacher Discussions on the case studies. Student group presentations (10-min presentation & 10 min for discussion and Q&A).

Module III: Social Equity and Neighborhood Analysis

>Exploring social equity issues through space technology; Analyzing spatial patterns of inequality and access to resources; Analyzing demographic, socioeconomic, and environmental factors; Group activity: Introduce available socioeconomic data for processing & analysis, identify gaps, challenges & opportunities; Student-Teacher Discussions on the case studies. Student group presentations (20-min presentation & 20 min for discussion and Q&A).

Module IV: Project Work: Neighborhood Exploration and Enhancement

>Formulation of project proposals addressing specific neighborhood challenges; Data; collection, analysis, and interpretation using space technology; Design and implementation of solutions for neighborhood improvement; Presentation of project findings and recommendations

Assessment:

- Attendance, Participation & engagement in class discussions and activities (30%)
- Assignments & Quizzes (assignment report, outcomes, presentation of assignment/project, communication skills, and Q&A performance of students) (10%):
- Project work (Project proposal, Data collection/analysis/fieldwork memo; project presentation and report) (40%)
- Final exam (20%): 90-minute open-book or closed-book subjective type examination