Remote Sensing and Aerial Photogrammetry

1.1 Course Number: CS382

1.2 Contact Hours: 3-0-0 Credits: 9

1.3 Semester-offered: 3rd Year-Odd

1.4 Prerequisite: A basic understanding of geoinformatics

1.5 Syllabus Committee Member: Dr. Sushum Biswas, Dr. Daya Sagar Gupta & Dr. Gargi Srivastava

2. **Objective:**

- Apply principles of Remote sensing and GIS to collect, map and retrieve spatial information.
- Plan, assess and evaluate natural and manmade systems using geospatial models and methods
- Use geospatial tools and techniques for hazard mitigation and resource planning.
- Pursue research and develop capabilities to handle multi-disciplinary field projects
- Work in teams and demonstrate leadership skills with professional ethics

3. **Course Content:**

Unit-wise distribution of content and number of lectures

Unit	Topics	Sub-topic	Lectures
1	Concepts and Foundations of Remote Sensing	Remote sensing; an ideal remote sensing system; a real remote sensing system; Remote sensing terminology; History and recent developments in remote sensing.	10
2	Electromagnetic Radiation	Energy sources and radiation principles; Sources and types of electromagnetic energy used in remote sensing; Energy interactions in the atmosphere; Energy interactions with earth surface features; Human eye and the camera.	10
3	Elements of Photographic Systems	The basic negative-to-positive photographic sequence; Photographic films: Black and White (Panchromatic) film, colour film, colour infrared film; Aerial cameras; Aerial photographs; Taking vertical aerial photographs; Scale and ground coverage of vertical aerial photographs; Photographic resolution.	10

4	Photogrammetry and Airphoto Interpretation	Geometric elements of vertical photographs; Relief displacement of vertical features; Image parallax; Parallax measurement; Stereoscopy; Stereoscopic instruments (pocket stereoscope, mirror stereoscope); Making stereograms; Fundamentals of Airphoto Interpretation: Basic Photo interpretation equipment; Elements of visual airphoto interpretation.	10
		Total	**40**

4. Readings

4.1 Textbook:

Agarwal, C.S. and Garg, P.K. 2000. Textbook of Remote Sensing in Natural Resources Monitoring and Management. New Delhi: Wheeler Publishing.

Avery, T.E. 1985. Interpretation of aerial Photographs. Minneapolis, Minnesota: Burgess Publishing Company.

Bakker, Wim H., et al. 2001. Principles of Remote Sensing – An Introductory Textbook. Enschede, The Netherlands: ITC.

4.2 Reference books:

Banerjee, R.K. and Banerjee, B. 2000. Remote Sensing for Regional Development. New Delhi: Concept Publishing Company.

Campbell, James B. 1996. Introduction to Remote Sensing (Second Edition). London: Taylor & Francis.

Colwell, Robert N. (ed.) 1983. Manual of Remote Sensing, Second Edition, Volume 1 and 2. Falls Church, Virginia: American Society of Photogrammetry.

5 Outcome of the Course: The students should be able to:

- Engage in critical thinking and pursue research/ investigations and development to solve practical problems.
- Communicate effectively on complex engineering activities with the engineering community and with society at large, write and present substantial technical reports.
- Demonstrate higher level of professional skills to tackle multidisciplinary and complex problems related to “Remote Sensing and GIS”.
- Apply principles of Remote sensing and GIS to collect, map and retrieve spatial information
- Plan, assess and evaluate natural and manmade systems using geospatial models and methods
- Develop geospatial models and tools to address the social and engineering problem