

Remote Sensing and GIS for Rural Development (MOOCs (SWAYAM))

Course Code: 22CEM1L1

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Summary

Course Type : Elective
Duration : 12 weeks
Category : Civil Engineering
Earth Sciences ,
,Credit Points : 3
Level : Undergraduate

Weblink:

https://onlinecourses.nptel.ac.in/noc23_ce52/preview

Course Outline:

ABOUT THE COURSE:

India, being an agrarian nation, has a vast majority population living in rural areas. Development of rural areas is a difficult task due to the complex heterogeneity of the rural landscape and social economic and ecological conditions, and observation data is limited due to cost and logistical factors. Geospatial technologies including Remote Sensing and GIS (RS & GIS) have tremendous potential in the development of rural areas due to its ability in handling large amounts of data, conducting spatial analysis over large areas, and decision-making in a comprehensive and timely manner.

The course is aimed to create the required skill set for working professionals, students, and academicians for addressing the challenges in rural development using free open-source software (e.g. QGIS). The topics covers basic principles of RS & GIS and subsequently selected applications of geospatial technology in priority areas including; agriculture, water management, soil conservation, disaster management, and monitoring of rural development initiatives.

Objectives:

1. Introduce the concepts of Rural Development
2. Illustrate the process involved in GIS and Image Processing
3. Imbibe the knowledge on open source software
4. Demonstrate the concepts of vector and raster data in GIS
5. Disseminate the case studies of RS and GIS in Rural Development

Course layout

Week 1: Introduction to rural development; concepts, issues, and linkages to water and food security

Week 2: Introduction to geospatial technology (RS&GIS) and its importance in rural development

Week 3: Introduction to open-source software for RS& GIS applications

Week 4: Introduction to GIS Part -I (Operations on vector data sets)

Week 5: Introduction to GIS Part -II (Operations on raster data sets)

Week 6: Digital remote sensing image processing Part -I (Georeferencing of map data, cartographic maps, shape file creation)

Week 7: Digital remote sensing image processing Part -II (Digital elevation model, land use land cover change analysis)

Week 8: RS & GIS for rural water resources management – (surface water management, groundwater management)

Week 9: RS & GIS for agriculture and soil management (farm linkages, irrigation, crop management, and mapping of storage infrastructure)

Week 10: RS & GIS application for rural healthcare, education, connectivity, and communication

Week 11: RS & GIS for impact assessment of government rural development schemes

Week 12: Applications and examples of RS & GIS for rural development: Selected case studies

Books and References:

1. **Field notes from instructor**
2. Lillesand and Kiefer, “Remote Sensing and Image Interpretation”, 5th Edition, published by John Wiley and Sons, 2008.
3. M.Anji Reddy, “Remote Sensing and Geographical Information systems”, 3rd Edition, B.S.Publications, 2006.
4. Basudeb Bhatta, “Remote Sensing and GIS” Oxford University Press