



REMOTE SENSING AND GIS FOR RURAL DEVELOPMENT

PROF. PENNAN CHINNASAMY

Center for Technology Alternatives for Rural Areas
IIT Bombay

INTENDED AUDIENCE : Students in Civil Engineering, Rural Development, Earth Science, Geology and Rural development departments

INDUSTRY SUPPORT : All government agencies/departments related to rural development, water resources, agriculture, soil conservation and disaster management. CSR initiatives of PSUs and the private sector.

COURSE OUTLINE :

This course is intended to introduce students to the fascinating world of analog electronics. The emphasis of the course is to build intuition behind the operation of circuits. To do this, we derive circuits ground-up, from first principles. The student is expected to have undergone a basic linear-circuit analysis course, but assumes no knowledge of device physics whatsoever.

ABOUT INSTRUCTOR :

Prof. Pennan Chinnasamy obtained his Masters degree in Physics from Wesleyan University, Connecticut - US, followed by a doctoral degree, with focus on hydrology, from University of Missouri, US. After his Research fellow position with Ashoka Trust for Research in Ecology and the Environment (ATREE), he joined the International Water Management Institute (IWMI) as a Researcher (Geohydrology and Remote Sensing), and was stationed in Nepal and Indian offices, where he focused on climate change impacts on under developed and developing nations. He then joined Nanyang Technological University, Singapore, as a Senior Researcher developing real time flood predicting models for Singapore. He is currently an Assistant Professor with Indian Institute of Technology, Bombay - India, under the Centre for Technology Alternatives for Rural Areas (CTARA) department, where his work primarily focuses on natural resources assessment, monitoring and management in rural regions. He is the founding director of the Rural Data Research and Analysis (RuDRA) lab, which is the first Big data lab for rural regions, housed in an academic institution in India. He is also an associate faculty with the Interdisciplinary Climate Program and Policy Study Centre in IITB. Pennan is also a visiting professor with University of Oulu, Finland. Over the past decade, Pennan has experience working in NGOs, national and regional government agencies and academic institutions, focusing on sustainable surface and groundwater management plans, climate change impacts, large data analysis and hydrological simulation models. His work has been recognized in many internationally peer reviewed journals, policy briefs and government reports (e.g. EPA, NEA- Nepal, World Bank, Asian Development Bank) and are being used to formulate scientifically validated best management plans.

COURSE PLAN :

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