

Lecture Topics for Special course on “RS & GIS applications in Water Resources Management”

Lecture / Date	Title	Content	Faculty
L-1 22/05/2017	Overview of RS & GIS Application in Water Resources Management	Introduction to RS & GIS with respect to Water Resources; All the applications of RS & GIS in Water Resources; Online Resources for Water Resources Data (IWRIS, Bhuvan, etc.)	SPA
L-2 23/05/2017	Hydrological Parameter Estimation using RS & GIS	Rainfall estimation (IR, Thermal, MW); Interpolation and limitations in interpolation; Interception, Soil moisture & ΔTWS ; Evapotranspiration; Water level and discharge Linkage to real world problems.	PKT & BRN
L-3 24/05/2017	Digital Elevation Model (DEM) hydro-processing, Watershed Characterization	DEM and its data sources; DEM hydro- processing for watershed characterization (watershed and stream network delineation, morphometric analysis) and other DEM derivatives Linkage to real world problems.	AC
L-4 25/05/2017	Hydrological Modelling with Geospatial Inputs	Type of models, model selection considering project objectives and geospatial inputs; Hydrological modeling (watershed to basin scale) Linkage to real world problems.	VG
L-4 26/05/2017	Snow/Glacier Mapping, Monitoring and Snow Melt Runoff Model	Snow, glacier, glacier lakes mapping and monitoring; Estimation of snow physical properties, glacier ice volume and glacier velocity Snow and glacier melt runoff modelling Linkage to real world problems.	PKT
L-6 29/05/2017	Soil erosion and Sediment modeling, Watershed Prioritization and Conservation Planning	Soil Erosion and sediment yield modeling using geo-spatial inputs; Water Prioritization; Conservation Planning; Site suitability analysis for Water harvesting structures; Monitoring & Impact assessment of watershed conservation using RS inputs; Linkage to real world problems.	BRN
L-7 30/05/2017	Waterbody Mapping, Water Quality and Reservoir Sedimentation Assessment using Remote Sensing	Waterbody mapping and monitoring; Water quality assessment;	VG

		Reservoir sedimentation assessment; Linkage to real world problems.	
L-8 31/05/2017	Application of Geospatial Techniques in Irrigation Water Management	Irrigation command area and infrastructure mapping; Irrigation potential assessment; Irrigation water requirement assessment; Conjunctive water use planning; Irrigation project performance assessment; Waterlogging and soil salinity mapping; Linkage to real world problems.	BRN
L-9 01/06/2017	Mapping, Monitoring of Hydro-meteorological Disasters and Damage Assessment	Flood mapping, monitoring using remote sensing inputs and damage assessment; Drought mapping, monitoring using remote sensing inputs and damage assessment; Operational flood and drought monitoring systems and initiatives.	SPA & BRN
L-10 02/06/2017	Flood Modelling and Early Warning Systems	Flood peak estimation; Integrated hydrological and hydrodynamic modeling for flood inundation assessment; Weather forecasting and flood early warning systems; Dam break and Glacier lake outburst flood (GLOF); Linkage to real world problems.	PKT & PRD
L-11 05/06/2017	Ground Water Prospects Zonation	Major Applications of RS & GIS in Hydrogeology; Remote Sensing Observations for Ground Water with examples; Methods of Ground Water Prospects Zoning; Rajiv Gandhi National Drinking Water Mission (RGNDWM) - Objectives and Methodology; How to Use Ground Water Prospects maps prepared under RGNDWM?	SKS
L-12 06/06/2017	Site Suitability Analysis for Water Resources Projects and Environmental Impact Assessment (EIA)	Site suitability using RS & GIS inputs for hydropower, drinking water, inter-basin transfer, irrigation canal network; RS & GIS inputs for EIA studies of water resources projects; Linkage to real world problems.	PKT
L-13 07/06/2017	Urban Hydrological studies using Geospatial inputs	Hi-resolution RS inputs for urban water infrastructure mapping; Potable water distribution network planning and modeling; Storm water modeling and planning; rainwater harvesting in urban areas; Impact of urbanization on water quality and quantity;	PKT

		Linkage to real world problems.	
L-14 08/06/2017	Climate and Land Use Land Cover Change impact on Water Resources	Land Use Land Cover change (LULCC) assessment using remote sensing; Climate change (CC); IPCC 5 scenarios, Downscaling of GCM data; Impact of CC and LULCC on river basin hydrology and water resources projects; Climate change adaptation and mitigation measures for water resources.	SPA
L-15 09/06/2017	Integrated Water Resources Management	Concept of Integrated Water Resources Management (IWRM); Basin level water balance studies to identify the water potential (surplus and deficit area); Inter-linking of rivers for IWRM; Geo-spatial inputs for trans-boundary (state and country level) water resources studies; Linkage to real world problems.	GF-1 Dr. Sharad Kumar Jain

Faculty :

SKS : Dr. S. K. Srivastav, GD, GT&OPG, IIRS

SPA: Dr. S. P. Aggarwal, Head, WRD, IIRS

PKT : Dr. Praveen Thakur, Sci./Eng. 'SF', WRD, IIRS

BRN : Dr. Bhaskar R. Nikam, Sci./Eng. 'SE', WRD, IIRS

VG : Dr. Vaibhav Garg, Sci./Eng. 'SE', WRD, IIRS

AC : Mr. Arpit Chouksey, Sci./Eng. 'SD', WRD, IIRS

PRD : Mr. Pankaj R. Dhote, Sci./Eng. 'SC', WRD, IIRS

GF-1 : Dr. Sharad Kumar Jain, Director General, NWDA. (Additional Charge), New Delhi/ Scientist 'G', NIH Roorkee