

Capacity Building in Geospatial Technology Area for Sustainable Coal Mining in India

Program Directors:

Dr. Sanjeev Kumar¹ and Dr. Manoj Mohanty²

¹Chair and Professor; Civil and Environmental Engineering

²Professor; Mining and Mineral Resources Engineering

Southern Illinois University Carbondale
Carbondale, Illinois, 62901



Purpose

Enhance Technical Capability of
Professionals from CMPDI in the area of
Geospatial Technology for Effective Mine
Land Reclamation and Sustainable
Development of Coal Resources in India



List of Topic Areas

- Global Positioning System (GPS)
 - Advanced GPS Mapping for Land Reclamation
 - Mobile Computing for Reclamation
- Geographic Information System (GIS)
 - Introduction to ArcGIS for Mining and Reclamation
 - ArcGIS Spatial Analyst for Mining and Reclamation
 - Image Analysis for ArcGIS
- Slope Stability Analysis
- Surface & Ground Water Hydrology
- Soil & Revegetation
- Erosion and Sediment Control



Project Team

- Dr. Sanjeev Kumar, SIU
- Dr. Manoj Mohanty, SIU
- Dr. Guangxing Wang, SIU
- Dr. Prabir Kolay, SIU
- Dr. Raja Sengupta, McGill University, Canada
- Dr. James Spotts, President, Southeastern Environmental Consultants; Retiree from US OSMRE
- Dr. David Buckner, Senior Plant Ecologist, ESCO Associates, Inc.; Retiree from US OSMRE
- Dr. Ed Carey, Retiree from US OSMRE



Program Directors

➤ Dr. Sanjeev Kumar, Chair, Professor and Distinguished Teacher

- ✓ Area of Expertise - Geotechnical Engineering
- ✓ Has led many training programs including Engineering Professionals Training and Summer Transportation Institutes
- ✓ Will oversee overall program implementation
- ✓ Co-Instructor for soil slope stability analysis module



**Southern Illinois
University Carbondale**

**U.S. - India Coal Working Group
8th Annual Meeting, New Delhi, India**

Program Directors

➤ **Dr. Manoj Mohanty, Professor**

- ✓ Area of Expertise – Mining and Mineral Engineering
- ✓ More than 25 years of experience (both in industry and academia) in coal mining and coal processing
- ✓ Executive Committee Member of Coal & Energy Division of SME
- ✓ Serving on the Board of Illinois Mining Institute
- ✓ Has excellent rapport with the Illinois Mining Industry
- ✓ Will be responsible for organizing the field trips and day-to-day activities



Course Instructors

➤ **Dr. Guangxing Wang:**

- ✓ Assistant Professor, Dept. of Geology, SIUC
- ✓ Expertise: Remote Sensing and GIS
- ✓ Has been teaching GIS, Remote Sensing, and Cartographic Design
- ✓ Research areas: Remote sensing, GIS, GPS, spatial statistics, and their applications to geography and environmental resources

➤ **Topics:**

- ✓ Advanced GPS Mapping for Land Reclamation
- ✓ Mobile Computing for Reclamation



Course Instructors

➤ **Dr. Raja Sengupta**

- ✓ Associate Professor, McGill University, Canada
- ✓ Expertise: GIS and Remote Sensing
- ✓ Has professional experience in GIS at three North American Universities
- ✓ Serving on the editorial board of the Open Environmental Journal, and the program committees for Spatial Knowledge

➤ **Topics:**

- ✓ Introduction to ArcGIS for Mining and Reclamation
- ✓ ArcGIS Spatial Analyst: for Mining and Reclamation
- ✓ Image Analysis for ArcGIS



Course Instructors

➤ Dr. Prabir Kolay

- ✓ Assistant Professor, Civil Engineering, SIUC
- ✓ Expertise: Geotechnical Engineering
- ✓ Teaching and research experience in India, Malaysia, and US
- ✓ Research focused on modeling in geotechnical engineering, soft ground improvement techniques, landfill liner design, cenospheres from CCBs

➤ Topics:

- ✓ Slope Stability Analysis



Course Instructors

➤ Dr. James Spotts

- ✓ Has taught similar course for over 30 years
- ✓ Served as a soil scientist, civil engineer, and project manager within several federal agencies in the US
- ✓ Directed a nationwide program to collect and analyze dredged material from national waterways
- ✓ Co-developed first training course for the US OSMRE in soil reclamation
- ✓ Visited the Jharia Coal Field Project as OSMRE team member

➤ Topics:

- ✓ Soil Erosion and Sedimentation Control



Course Instructors

➤ Dr. David Buckner

- ✓ Has over 40 years of professional experience in applied plant ecology, plant taxonomy, reclamation, and statistics
- ✓ Senior Plant Ecologist at the ESCO Associates Inc.
- ✓ Was senior author of a 1985 report to the U.S. Congress (Office of Technology Assessment) on the status of revegetation
- ✓ Retired from US OSMRE

➤ Topics:

- Soil and Revegetation



Course Instructors

➤ Dr. Ed Carey

- ✓ Worked with OSMRE as a mining and reclamation program analyst and a technical trainer
 - ✓ Taught Surface and Groundwater Hydrology Course
 - ✓ Train-the-trainer course, and
 - ✓ Master Instructor Forum course
- ✓ Retired from the US OSMRE
- ✓ One of the Agency's outstanding instructors

➤ Topics:

- ✓ Surface and Ground Water Hydrology



Technical Field Trips

- Field visits and hands-on experience with field data
- At least four field trips active surface mines and reclaimed mine sites to supplement the in-class and in-lab instructions
- Additional field trips may be considered based on the interest of the CMPDI Management
- All transportation arrangements will be made by the Program Directors



Educational Tours



**Southern Illinois
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Why SIUC

- One of the most comprehensive universities in the area
 - Carnegie-Classified High Research University
 - 20,000 Students, 25 Doctoral, 70 Master's, and 80 Undergraduate Degree Programs
 - The only Mining Engineering program in the States of Illinois, Indiana, Iowa, and Wisconsin
 - Close proximity (within an hour drive) to several coal mines and reclaimed mine sites



Why SIUC

- Hosted hundreds of international scholars and professionals
- Completed agriculture training for professionals from Turkey, Nepal, and Pakistan
- Program directors have significant experience of organizing professional programs
- Very welcoming community to international visitors
- Well qualified team of instructors



Daily Schedule

Proposed Duration: July 1 to 31, 2011

Tentative Daily Schedule (except field days)

Hotel Pick up	8.30 am
Session 1	9:00 -10.30 am
Coffee break	10:30 – 10:45 am
Session 2	10.45 am - 12.15 pm
Lunch	12:15 – 1:30 pm
Session 3	1.30 pm - 3.00 pm
Coffee break	3:00 – 3:15 pm
Session 4	3.15 pm - 4.45 pm
Hotel Drop off:	5 pm



Questions?

