Short Courses

Four short courses will be offered in conjunction with the AEG Annual Meeting. The courses selected offer attendees a wide variety of educational opportunities. The courses are accredited for continuing education units (CEUs) and include course materials, lunch and coffee/soda breaks.

Short Course #1:
Field Geologic Mapping Using GIS & Tablet PCS

(Sponsored by AEG North Central and Allegheny–Ohio Sections)

Date: Tuesday, September 22
Time: 8:00 am to 6:00 pm
Location: Room – Tahoe A
Cost: $260 (Includes Lunch)

Field geology is greatly benefiting from advancements in information technologies of all kind. In particular, the use of ruggedized tablet and handheld computers with integrated GIS, GPS, data management, video and audio capabilities, and pen-based interfaces present a fundamentally new way to map and collect data in the field. This workshop will provide an overview of various digital technologies and their applications in field settings. It will focus on sharing and discussing criteria for acquiring and utilizing various hardware and software solutions for field geology, based on the goals and needs of field projects, logistics, and budgets. Demonstrations and some hands-on opportunities will provide experience with various technologies, including Tablet PCs, Pocket PCs, the geospatially-integrated collection and analysis of notes, audio, photographic, video and geologic information, and collaborative field work using wireless networking.

About the Instructors

Peter Knoop is currently at the University of Michigan. He is pursuing a variety of projects in information technology and information sciences in the field of collaboration and learning environments, reaching across the Duderstadt Media Center, Department of Geological Sciences, and the School of Information. He is also the Project Coordinator for the Sakai Foundation, an open-source Collaboration and Learning Environment in use at many universities and organizations around the world. He received a BS in Atmospheric, Oceanic and Space Sciences in 1989 with an emphasis in Oceanography, a MS in Marine Geology and Geochemistry in 1992, and pursued a PhD in Marine Geology and Geochemistry (ABD) at the University of Michigan. His work has been supported by the National Science Foundation, Hewlett-Packard, Melon Foundation, Kellog Foundation, and Microsoft. He is the co-Principal Investigator on the GeoPad project, founded in 2003, and funded in part by the National Science Foundation to develop and disseminate best-practices for integrating modern IT into field geology courses, and has been involved in teaching a variety of field courses at the University of Michigan's Rocky Mountain Field Station.

Mark Manone received his BA in Geography with emphasis in Remote Sensing/GIS in 1992. He has been an Authorized ESRI ArcGIS Instructor since 2003 and a Research Associate/Instructor in the Geology Department at Northern Arizona University since 1994. Mark has designed and implemented GIS courses in the Geology Curriculum and has performed numerous GIS training courses for private, State, Federal and Tribal agencies. Mark has also been very instrumental in the integration of geospatial data and technologies in several classes within the Geology, Environmental Sciences and Biology Departments.

Short Course #2:
3D Laser Scanning for Rock Engineering Design & Geo-Infrastructure Monitoring

(Sponsored by Andregg Geomatics)

Date: Tuesday, September 22
Time: 8:00 am to 6:00 pm
Location: Room – Tahoe B
Cost: $260 (Includes Lunch)

Ground-based LiDAR (also called 3D laser scanning) is being used more and more for rock engineering applications and rock mechanics and geoscience research. An important new application is to monitor the aging geo-infrastructure which includes highway slopes, dam and bridge foundations, tunnels and other underground excavations, and natural hazards that impact the built environment including landslides, earth fissures and debris flows. Applications include semi-automated rock mass characterization for surface slope stability and underground stability, monitoring of rock slopes and tunnels for displacements and rockfall occurrences, and detailed site characterization for engineering and monitoring. This one-day short course will provide detailed information and hands-on training on how to utilize LiDAR for the applications mentioned above. The focus of the workshop will be on "best practices" for the use of LiDAR in the field, and the use of semi-automated point cloud processing software for analyzing the LiDAR data. All participants will receive a 6-month license for the Split FX point cloud processing software (www.spliteng.com). Participants will also receive a CD containing numerous tutorials from actual field case studies. The short course will start with an overview of rock mass characterization and rock mass monitoring using LiDAR, followed by a series of demonstrations and hands-on tutorials. The short course will conclude with discussions on the various applications, and expected improvements in the technology (hardware and software) in the future.

About the Instructors

Dr. John Kemeny is a professor in the Department of Mining and Geological Engineering at the University of Arizona, and also partner and Director of Research at Split Engineering, LLC. Dr. Kemeny has over 25 years of experience in rock mechanics and over 15 years experience with using new technologies such as digital image processing and LiDAR for rock engineering applications.

Ryan Darling is the 3D Laser Scanning Division Manager at Darling Environmental & Surveying in Tucson, Arizona. Ryan has over ten years of experience in Surveying and Drafting and seven years of experience utilizing 3D Laser Scanning technology

for a wide range of applications. Darling Environmental and Surveying is one of the biggest contractors for 3D laser scanning services in the United States.

Short Course #3:
Seismic Site Response Evaluations

(Sponsored by California Laboratory Services, GeoMotions LLC)

Date: Saturday, September 26
Time: 8:00 am to 6:00 pm
Location: Room - Tahoe B
Cost: $260 (Includes Lunch)

This ten-hour short course focuses on the key aspects of performing a site-specific site response evaluation. Deterministic and probabilistic seismic hazard assessment approaches will be presented. The incorporation of seismic source characterization, NGA ground motion predictive relations, and site effects (e.g., VS30) in the seismic hazard assessment will be discussed. Primary sources of uncertainty will be identified, and their potential impact on ground motion estimates will be emphasized. Use of the recently adopted 2006 IBC/ASCE 7-05 standards to develop a site-dependent design spectrum will be explained with worked examples. Additionally, the code-based site-specific ground motion procedures for seismic design that are outlined in Chapter 21 of ASCE7-05 will be presented.

Each attendee will be given course notes that support the lectures. The handouts include hard copies of all presentations for taking notes and a CD-ROM that contains electronic copies of all presentations in color and relevant reference papers.

About the Instructors

Jonathan D. Bray, PhD, PE, is a Professor of Geo-Engineering at the University of California, Berkeley. He earned engineering degrees from West Point (BS), Stanford University (MS), and the University of California, Berkeley (PhD). Dr. Bray has been a registered professional civil engineer since 1985, and he has served as a consultant on several engineering projects, including as a peer reviewer. He has authored more than 200 research publications. His expertise includes seismic site response, dynamic soil properties, earthquake ground motions including near-fault effects, liquefaction and ground failure, seismic performance of earth and waste fills, and earthquake fault rupture propagation. He has received several honors, including ASCE Fellow, Shamsher Prakash Research Award, ASCE Huber Research Prize, Packard Foundation Fellowship, NSF Presidential Young Investigator Award, and two NAGS awards.

Neven Matasovic, PhD, PE, GE is an Associate with Geosyntec Consultants and a graduate of University of California, Los Angeles (PhD). Dr. Matasovic is a developer of the computer program DMOD2000, which is widely used for performing nonlinear effective-stress site response analysis. He is an expert on soil dynamics and has developed other computer programs such as one for Newmark seismic deformation analysis with degrading yield acceleration. He is a pioneer in developing evaluation and mitigation methods for the seismic design of earth and waste structures. Dr. Matasovic received the Prakash Foundation award for excellence in the practice of geotechnical earthquake engineering, a discipline in which he has authored and co-authored more than 60 technical papers and publications, including seismic design guidance documents that are used in engineering practice.

Short Course #4
Introduction to Rockfall Analysis and Mitigation

(Sponsored by HDR/Devine Tarbell)

Date: Saturday, September 26
Time: 8:00 am to 6:00 pm
Location: Room - Tahoe D
Cost: $260 (Includes Lunch)

This course will provide a basic introduction to rockfall analysis and protection. Participants will learn how to conduct field work for rockfall mitigation and empirical methods for mitigation. In addition, the principles of the Colorado Rockfall Simulation Program (CRSP) will be reviewed with hands-on rockfall problems. Finally, attendees will be exposed to the different methods of rockfall mitigation with a survey of available products and mitigation techniques. All participants will receive a copy of the Colorado Rockfall Simulation Program.

I. Overview of rockfall mechanics and protection concepts
   A. Topics will include rockfall hazard rating systems
   B. Ritchie method for rockfall protection
   C. Field work
II. Introduction to the Colorado Rockfall Simulation Program (CRSP)
   A. Participants will learn the use of the program's software
   B. How results are used to identify possible mitigation options
   C. Case Studies: "Rockfall Simulation using CRSP"
III. Overview of rockfall mitigation techniques
   A. Draperies
   B. Active systems
      1. TECCO
      2. SPIDER
   C. Rigid barriers
   D. Flexible barriers
   E. Hybrid systems
   F. Embankments and Berms
IV. Summary
   A. Costs
   B. Q&A

About the Instructors

Dr. William F. Kane received his BA (1975) in geology from James Madison University, and his MS (1981) and PhD (1985) degrees in Civil Engineering from Virginia Tech. He is President of KANE GeoTech, Inc., Stockton, CA, which he founded in 1997. Dr. Kane has consulted and done research in the areas of rock and soil mechanics, ground subsidence, slope stability, geotechnical instrumentation, and rockfall mitigation. As an award winning professor, he taught civil engineering and engineering geology at the universities of Tennessee, Pacific, and Alabama-Huntsville. His firm consults on a variety of geotechnical problems for many local, state and federal agencies as well as private industry. He has authored or co-authored approximately 80 technical papers and reports. Professionally, Dr. Kane is a registered professional engineer in the States of Arizona, California, Colorado, Idaho, Hawaii, Kentucky, Montana, New Mexico, and Nevada and a registered professional geologist in the State of Tennessee. Dr. Kane conducts engineering workshops in the U.S. and internationally. He has appeared as a geotechnical expert