

SECE PROGRAM LESSON LIST – 1st COHORT COURSE DATES

COURSE 1 – May 1 to June 4, 2023

Lesson 1: Energy Transition Grand Challenges
Lesson 2: Carbon Capture and Sequestration - Description, Definitions, Challenges
Lesson 3: Hydrogen Production and Storage - Description, Definitions, Challenges
Lesson 4: Geothermal Energy - Description, Definitions, Challenges
Lesson 5: Critical Elements for the Energy Transition - Description, Definitions, Challenges
Lesson 6: The Geological Foundation in Western Canada for Clean Energy Pathways
Lesson 7: Global CO ₂ Emissions and the Need for Geological Sequestration
Lesson 8: Fluid Properties/Phase Behavior of CO ₂
Lesson 9: Subsurface Targets for CO ₂ Storage: Saline Aquifers
Lesson 10: Subsurface Targets for CO ₂ EOR
Lesson 11: Subsurface Targets for CO ₂ Storage: Deep Coal
Lesson 12: Overview and Site Tour of the Newell County Facility Operated by Carbon Management Canada
Lesson 13: Innovation driving the hydrogen economy
Lesson 14: H ₂ production from natural gas
Lesson 15: H ₂ production from oil and bitumen
Lesson 16: EHR Process: Clean hydrogen from unmineable coal
Lesson 17: Utility-scale subsurface hydrogen storage
Lesson 18: Principles of geothermal energy
Lesson 19: Geothermal Energy from Hot Sedimentary Basins
Lesson 20: Closed-loop geothermal systems
Lesson 21: Introduction to critical elements
Lesson 22: Critical minerals in Energy Transition: Lithium
Lesson 23: Fundamentals of Helium exploration, including economic factors
Lesson 24: The advent of small modular nuclear and challenges for deep geological sequestration

COURSE 2 – June 5 to July 9

Lesson 1: Application of Petroleum Geoscience and Engineering to CEP Evaluation
Lesson 2: Importance of Core Analysis for CEP Evaluation
Lesson 3: Routine Core Analysis: Core Preparation and Porosity Estimation
Lesson 4: Routine Core Analysis: Permeability Estimation
Lesson 5: Special Core Analysis: Wettability Determination
Lesson 6: Special Core Analysis: Relative Permeability Estimation
Lesson 7: Special Core Analysis: Rock Mechanical Properties Estimation
Lesson 8: Virtual Lab Tour of Tight Oil Consortium/Transitional Energy Consortium Laboratory
Lesson 9: Importance of Log Analysis for CEP Evaluation
Lesson 10: Subsurface Formations and Lithologies for CEP Students
Lesson 11: Wireline Log Data of Interest to CEP Students
Lesson 12: Case Study: Integration of Log, Drilling and Cuttings Data Analysis for Evaluating Reservoir and Completion Quality
Lesson 13: Importance of RTA for CEP Evaluation
Lesson 14: Fundamentals of RTA: Concepts and Definitions
Lesson 15: Fundamentals of RTA: The Diffusivity Equation and Solutions to the Diffusivity Equation
Lesson 16: Fundamentals of RTA: Accounting for Fluid and Operational Complexities
Lesson 17: Fundamentals of RTA: Overview of RTA Methods and Workflow
Lesson 18: Case Study: RTA Methods and Workflow Applied to Shale Gas Well
Lesson 19: Productivity and Injectivity Index Determination

Lesson 20: Importance of PTA for CEP Evaluation
Lesson 21: Overview of Conventional PTA Concepts
Lesson 22: Case Study: Application of Conventional PTA Methods to Shale Gas Well
Lesson 23: Diagnostic Fracture Injection Tests (DFITs)
Lesson 24: Post-Fracture Pressure Decay (PFPD) Analysis
Lesson 25: Importance of Drilling Data Analysis for CEP Evaluation
Lesson 26: Importance of Geochemical Analysis of Produced Fluids for CEP Evaluation
Lesson 27: Introduction to seismic methods used for oil and gas exploration
Lesson 28: A brief primer on seismic processing and interpretation
Lesson 29: Case studies of 4D seismic applied to mapping CO2 plumes in the subsurface Lesson
Lesson 30: Induced Seismicity Monitoring: Clean Energy Pathways
Lesson 31: Microseismic Monitoring: Clean Energy Pathways
Lesson 32: Distributed acoustic sensing (DAS)

COURSE 3 – July 10 to July 30

Lesson 1: Introduction to public perception of subsurface CEPs
Lesson 2: Induced seismicity case study for CCS
Lesson 3: Global political and socioeconomic drivers for the energy transition
Lesson 4: Introduction to life-cycle assessment
Lesson 5: Regulating CO2 Sequestration and Storage in Alberta
Lesson 6: Fort Nelson First Nation Clarke Lake Geothermal Project