Contents of CPD Activities as per Calendar-2018

Continuing Engineering Education Center, University of Engineering & Technology, Lahore

PEB Registration No: PEB - B - UETLHR - 0034

Name of PEB Coordinatot: Prof. Dr. Mohammad Ilyas Anjum

Activity No. 1	
CPD Title:	Two stroke engines : problems and solutions
Objectives:	To discuss the basic engine concepts in practical perspective. Mainly foucs on the problems of two
Main Contents:	1) A Brief Introduction to I. C. Engine.
Target Participants:	All graduate, postgraduate students, faculty members and Industrial professionals
Duration:	01 day

Activity No. 2	
CPD Title:	How to write a research paper
Objectives:	To learn independent problem solving and effectively communicate research findings
Main Contents:	1) Motivation for research. Finding a problem to solve.2) Literature review. Software: Mendeley, Endnote.3) Writing. Software: Latex, Jabref, Origin4) Paper submission
Target Participants:	All graduate, postgraduate students, faculty members and Industrial professionals
Duration:	01 day

Activity No.3	
CPD Title:	Essential Skills for Scientific Writing
Objectives:	To learn the skills requied for better scientific commnunication
Main Contents:	1. Basic errors in scientific commnunication 2. Essential skills required to write properly 3. Software tools
Target Participants:	Open for all
Duration:	1 day

Activity No.4	
CPD Title:	Material Synthesis and Optical Properties of Materials
Objectives:	1. To explain synthesis techniques for novel materials fabrication. 2. To explain the optical properties, characterization techniques and applications in optical fields.

Main Contents:	a. The classes of novel materials. Synthesis of novel materials through Physical and Chemical techniques. b. What are optical properties of materials. Determination of optical constants of materials through different characterization techniques, data analysis and applications.
Target Participants:	Civil Engineers, Mechanical Engineers, Metallurgical and Material Engineers, Chemical Engineers,
Duration:	1 day

Activity No.5	
CPD Title:	Hydrological studies for Hydropower Projects
Objectives:	To assess the mean annual water discharge, design floods and mean annual sediment discharge at a dam site location.
Main Contents:	a. Flow study for a hydropower project site b. Low flow analysis c. Flood study for a hydropower site d. Dam break study e. Sedimentation study for the site f. Assessment of life of reservoir without flushing g. Flushing of reservoir sedimentation
Target Participants:	Civil Enineerinrs, Agricultural Engineers, Water Resources engineers, water managers
Duration:	1 day

Activity No. 6	
CPD Title:	Introduction to Industrial Robotics
Objectives:	The central aim of this workshop is to enable the participants to employ robotic manipulators in a multitude of industrial settings to meet the chhallanges facing production in the future. The certificate course provides hands-on experience to program industrial robotsm on one hand, and on the other addresses the current state of the art in robot-centered smart-sutomation.
Main Contents:	i) Identify and select components for a given robot-centered automation task including the handling technology, industrial robotis, sensors and controls. ii. Program industrial robots to perform a multitude of different tasks including pick-and-place, pick-and-place with points, path following and trajectory following tasks. iii. Analyse implemented automated system for further improvements in robot-motion.
Target Participants:	Engineers working in industry, Masters and Ph. D. Studetns
Duration:	1 Day

Activity No. 7	
CPD Title:	Characterization Techniques for Plastics, Rubbers and Composites
Objectives:	To learn major techniques for characterization of plastics, rubbers and composites
Main Contents	Introduction to Machine Learning (ML) Applications of Machine Learning in different fields Earthquake Damage Prediction
Target Participants	Computer Scientists, Data Analysts, Earthquake & Structural Engineers
Duration	1 Day

Activity No. 8	
CPD Title:	Scientific Writing for Impact Factor Journals
Objectives:	One aim of the scientific writing is to share the experimental results with peers and scientific world. An efficient writing guarantees good reviews and the earliest publication. This course is designed to enhance the writing capabilities of professionals who are interested to share their professional knowledge and research experiences in the respective fields through quality publications.
Main Contents	a. What makes good writing? b. What is an original idea? c. Examples of dull academic writing d. Paragraph-level and sentence-level tips e. Suggestions on revision
Target Participants	A. Early career researchers, faculty members, and professionals doing research and interested to enhance writing skills B. Postgraduate students of all basic and applied sciences
Duration	1 Day

Activity No. 9	
CPD Title:	Ceramics Structural and Advanced Applications
Objectives:	To familiarize the gradulate engineers with the tradional and advanced applications of ceramics. To introduce them with latest trends in various trends in various research.
	1. Basics of ceramics

Main Contents	1. Basics of ceramics 2. Major Applications of tradional and Advanced Ceramics. 3. Important parameters required for various pplications. 4. Effects of defects and microstructure on properties 5. Case studies
Target Participants	Material Engineers, Manufacturing Engineers, Chemical Engineers, Mechanical Engineers
Duration	1 Day

Activity No.10	
CPD Title:	Business for Scientists and Engineers: Entrepreneurship
Objectives:	To transform engineers to entrepreneurs so that they would be able to bear risks, bring innovation, generate employment, and mobilize resources
Main Contents:	a. Theories and Significance of Entrepreneurship b. Models of Entrepreneurship Development c. Establishing a New Enterprise d. Recognizing Opportunities &Generating Ideas e. Writing a Business Plan f. Expansion Strategies of an Enterprise g. Personnel Planning & Recruiting
Target Participants:	Civil Enineerinrs, Agricultural Engineers, Water Resources engineers, water managers
Duration:	1 day

Activity No. 11	
CPD Title:	Applications of Computational Fluid Dynamics in Academia and Industry
Objectives:	Introducing engineers to the significance of Computational Fluid Dynamics (CFD), Discussing basics of CFD, conducting tutorials on different applications.
Main Contents:	1) A Brief Introduction to CFD 2) Basics of CFD 3) Key steps involved in CFD analysis 4) Tutorials on flow and heat transfer analyses
Target Participants:	All graduate, postgraduate students, faculty members and Industrial professionals

Duration:	01 day

Activity No.12	
CPD Title:	Crystal Structure by X-ray diffraction.
Objectives:	To familiarize the Engineers and scientist about the X-ray diffraction technique.
Main Contents:	a. Working principle and working of X-ray diffractometer. b. Determination of crystalline structure. d. Bulk materials. e. Thin films. f. Nanomaterials.
Target Participants:	All Engineers and scientists.
Duration:	1 day

Activity No. 13	
CPD Title:	Carbon Capture Storage and Utilization (CCSU)
Objectives:	• The course will provide a general introduction to CCSU technology, including capture, transport, storage and utilization of CO2. • Integral to course will be an insight from planned and developing projects around the world.
Main Contents:	• CCSU Overview • Climate Change Science • CO2 Capture Technology Fundamentals • Understanding CO2 properties for transport, storage and utilization
Target Participants:	• Engineers, Technical Managers, Policy Makers in the field of energy, power and environment. • Individuals, companies, agencies or regulatory bodies, either public or private involved in climate
Duration:	1 Day

Activity No. 14	
CPD Title:	Introduction to Computer Aided Analysis and Design of Buildings
Objectives:	To get an idea of 2-D and 3-D analysis concepts for buildings. Introduction to analysis and design of multistorey bulding in ETAB. Introduction to analysis and design of selected footing in SAFE.

Main Contents:	To get an idea of 2-D and 3-D analysis concepts for buildings Introduction to gravity, earthquake and wind loading Development of 2-D and 3-D building model in ETABS Analysis and design of multistorey bulding in ETABS Analysis and Design of selected foundation in SAFE
Target Participants:	Civil Engineers, Junior structural engineers, Architectural engineers.
Duration:	1 Day

Activity No. 15	
CPD Title:	Raman Spectroscopy. Dilute magnetic semiconductors for spintronics.
Objectives:	1. To discuss and principle, working and applications of Raman Spectroscopic techniques in
Main Contents	a. Principle and working of Raman Spectrometer.
	b. Utilization of Raman Spectrometer in different industries.
	c. Basics about the spintronics and diluted magnetic semiconductors.
	d. Research highlights of different characterization tools utilized to study the properties of DMS
Target Participants	Mechanical Engineers, Metallurgical and Material Engineers, Chemical Engineers, Electrical Engineers, Computer Engineers, Physicists, Chemists.
Duration	1 Day

Activity No. 16		
CPD Title:	A Quick brief on Project Management.	
Objectives:	To equip engineering professional with basic project management tools.	
Main Contents:	Definition of project, management and plans; life models; manager and his functions; conception and initiation; phases of project; management theories and concepts.	
Target Participants:	Engineering University faculty members, consultants, Academicians, engineering educationists and researchers etc.	
Duration:	1 Day	
Activity No. 17		
CPD Title:	Motivation & Moral Management: How to keep you and your subordinates actively participative?	

Objectives:	To help participants stay motivated and keep their subordinates motivated for the relevant roles and responsibilities.
Main Contents:	Basic concepts of motivation, theories of motivation; maintenance vs motivation; factors associated with motivation and moral building; etc.
Target Participants:	All engineering professionals
Duration:	1 day

Activity No. 18	
CPD Title:	Role of Large Dams in Sustainable Development of Pakistan
Objectives:	The objective of this course is
Main Contents:	
Target Participants:	Civil Engineers, Site engineers, Structural Engineers, Architectura engineers, Project Managers, Architects
Duration:	1 day

Activity No. 19	
CPD Title:	Nano Particles and its Various Applications
Objectives:	Types of international cements Strength gain in concrete. Chemical admixtures and Mineral admixture/ pozzolans/ SCMs Producing special concretes Durability issues:(Controlling Corrosion, Alkali aggregate , sulphate attacks, Freezing and thawing and initial cracks) Concrete tests (Destructive , Non destructive) Introduction of fast track construction using form works

Main Contents:	Introduction to Nanomaterial Properties and applications of nanomaterials. Analytical techniques. Particle Size Analyzer SEM XRD AFM DLS Spectroscopic techniques
Target Participants:	graduates and postgraduate students and faculty members doing research and working on chemistry specifically chemistry in relevance to nanomaterials.
Duration:	1 Day

Activity No. 20	
CPD Title:	Cements and Concretes
Objectives:	The participants will get awareness about new trends in construction .They will be able to produce special concretes with desired characteristics and will be able to solve everyday concrete durability problems.
Main Contents:	Strength gain in concrete. Chemical admixtures and Mineral admixture/ pozzolans/ SCMs Producing special concretes Durability issues:(Controlling Corrosion, Alkali aggregate , sulphate attacks, Freezing and thawing and initial cracks) Concrete tests (Destructive , Non destructive) Introduction of fast track construction using form works
Target Participants:	Civil Engineer, Architectural Engineers, Architects, Transportation Engineers, Site engineers
Duration:	1 Day

Activity No. 21	
CPD Title:	A light weight self-compacting concrete (Foam concrete) with recycled glass powder: Application in
Objectives:	The objectives of this program are to review the state of the art in the use of foam concrete in

Main Contents:	Foam concrete possesses characteristics such as low weight, low density, high flowability and self-compacting concrete, low cement content, low aggregate usage and high thermal insulation. In this one day seminar, details of mix designs of foam concrete, axial and flexural testing of wall panels of
Target Participants:	Civil Engineers, Transport and Traffic Engineers, Project Managers and Architects
Duration:	1 day

Activity No. 22	
CPD Title:	Do you do communicate effectively?
Objectives:	To train the participants on effective ways of communication and to help them improve their communication skills.
Main Contents:	Basic concepts of motivation, theories of motivation; maintenance vs motivation; factors associated with motivation and moral building; etc.
Target Participants:	All engineering professionals
Duration:	1 Day

Activity No. 23	
CPD Title:	Project Risk Management
Objectives:	Risk management is inevitably involved in every aspect of planning and implementing a project. A risk identification workshop will help reduce project uncertainty and volatility around project scope, schedule, quality, and cost variances.
Main Contents:	**a.** Introduction to Risk and Risk Management basics **b.** Risk appetite and tolerance **c.** Types of risk **d.** Techniques for identification **e.** Evaluating impact **f.** Quantitative and qualitative risk analysis methods **g.** Risk Management Plan
Target Participants:	An excellent opportunity for: Engineers of all types, project managers and project team members, programme managers, project sponsors, planning advisers, technical managers, project engineers, system engineers, software systems engineers, those who are involved in the design, procurement, and implementation of technical, construction, IT, or service projects.
Duration:	1 day

Activity No. 24	
CPD Title:	Tools to Improve Your Professional Writing
Objectives:	
Main Contents:	
Target Participants:	Engineers of All Disciplines
Duration:	1 Day

Activity No. 25	
CPD Title:	Perovskite Structures and its Applications in Energy devices
Objectives:	Learing of new ceramic structures, synthesis and its applications in fabrication of energy devices.
Main Contents:	1. Perovskite structure 2. Electromechanical properties and interpertation 3. Hybride structures 4. Energy devices fabrciation and applciations
Target Participants:	Metallurgical and Materials Engineers, Chemial and Polymer Engineers, Physicist and Open to all
Duration:	1 day

Activity No. 26	
CPD Title:	Slope Stability
Objectives:	To give participants a basic run-through identification of rock type and structure and a an overview of rock support system in slope and tunnel engineering. The topic covers slope as well as roof control systems.
Main Contents:	Basic introduction to rock types and structures; rock characterization methods; roof support system; slope support systems, rock bolts; etc.
Target Participants:	Mining, geological and civil engineering professionals.
Duration:	1 Day

Activity No. 27	
CPD Title:	Particle Swarm Optimization and Its Variants: Applications and Implementations

Objectives:	Particle swarm optimization has now become a famous meta heuristic optimization algorithm in terms of its applications in various optimization problems. It has shown brilliant performance in optimization problems in the domain of electrical engineering. Many masters and PhD students can use these algorithms as tools in their research works.
Main Contents:	The workshop aims to familiarize the audience about the MATLAB programming of PSO algorithms on optimization problems. Some test functions will be taken and will be programmed.The course is aimed to cover the fundamental concepts of diagnostics and condition monitoring of electrical equipment for insulation coordination assessment. The magnitude of the operating and the associated test voltages stressing the electrical equipment will be reviewed. The electrical and physical properties of the insulation of electrical equipment in characterizing and assessing the condition of the materials will be covered. A range of non-destructive, physical and chemical diagnostic test methods will be also discussed.
Target Participants:	The Masters and PhD students who want to learn meta-heuristic optimization techniques.
Duration:	1 Day

Activity No. 28	
CPD Title:	Water Resources Management in Pakistan: Threats and Opportunities
Objectives:	To discuss water resources situation, management issues and challenges faced by the country.
Main Contents:	1) Options, on-going and futuristic projects and strategies available to cope with water problems. 2)Water resources management in arid agricultural areas.
Target Participants:	All engineers registered with PEC
Duration:	01 day

Activity No. 29	
CPD Title:	Investigation of Mechanical Properties of Concrete
Objectives:	The objective of this course is to know about the mechanical properties of concrete. Determination of different mechanical properties of concrete ad their evolution over the time. Testing methods to find out the properties of concrete.
Main Contents:	Introduction to mechanics of concrete. Discussion on mechanical properties of concrete. Testing methods and Analytical methods to find out concrete properties. Evolution of mechanical properties of concrete. Discussion on research work on properties of concrete.

Target Participants:	Civil Engineers, Site engineers, Structural Engineers, Architectura engineers, Project Managers, Architects
Duration:	1 day

Activity No. 30	
CPD Title:	Technical Writing for Engineers
Objectives:	• To enable the participants to write effective emails, letters and abstracts. • To enable the participants to cite and paraphrase properly while writing reports. • To make the participants understand the format and intricacies of a technical report.
Main Contents:	a. Understanding of various transportation systems; development and evolution, b. Significance of evalauting economic and statistical aspects of these systems; assessing the needs and outcomes c. Concepts, methods and techniques for evaluation d. Use of relevant software and computing tools e. Case studies of practical applications/implementation
Target Participants:	• All engineering graduates who intend to hone their technical writing skills • Engineering students and faculty member
Duration:	1 day

Activity No. 31	
CPD Title:	Budget Sheet, Budget Distribution and Auditing of Budget
Objectives:	The objective of this lecture is to Learn the ways of: Creating a Budget Distribution of Budget Setting Budget Heads Division of Budget Heads into Sub Heads How to create a Budget Sheet The objective of this lecture/Workshop is to provide basic knowledge about audit, budget monitoring and comparison of budgeted revenues and expenses for correct and timely posting, and timely corrections of errors. Government Auditing Standards will be used to do the audit work. The review of a relevant budget and accounting record will be discussed as an example.

Main Contents:	1. Discussions on Budget Distribution into Heads and Sub heads. 2. How to utilize Budgets according to PPRA rules. 3. Creating Budget Sheets with complete entries and details 4. How to manage budget on an annual and monthly basis. • Issuing a Purchase Order against the budget Purpose and objectives of the audit • scope and methodology • Evidences of budget vs actual • Scrutiny or auditing of budget • Turnaround time on budget modifications and audit 5. Executive summary
Target Participants:	Faculty members, students, professionals, research scientists interested in this field. Faculty Members, Students, Food Industry, Biotechnologists, Food Inspectors, Pharmacists, Medical Professionals, Research Scientists
Duration:	1 Day

Activity No. 32	
CPD Title:	Study on Concrete Filled Fibre Reinforced Polymer Tube (CFFT) Columns: An innovative and practical solution to overcome steel corrosion issue.
Objectives:	Fibre Reinforced Polymer (FRP) reinforcement has emerged as a viable alternative for steel RC structural elements in corrosive environments. The objective of this seminar will be to investigate the axial and flexural behaviour of circular CFFT columns with and without FRP reinforcing bars.
Main Contents:	To study the compression, tensile and flexural testing of FRP bars. To study the axial and flexural behavior of CFFTs both experimentally and analytically. To review the available ACI 440.1R-16 design provisions for using FRP reinforcement in structural design and practice.
Target Participants:	Civil Engineers, Structural Engineers, Project Managers, Architects
Duration:	1 day

Activity No. 33	
CPD Title:	Biomedical applications of Nanoparticles and magnetic properties of materials.
Objectives:	1 To familiarize the engineers about the synthesis, characterization, and biomedical applications of nanoparticles. 2 To familiarize the engineers about the magnetism, magnetic materials, and its applications.

Main Contents:	a. Synthesis and characterization of nanoparticles. b. Biomedical applications of nanoparticles. c. Basic concepts of magnetism and magnetic materials. d. Characterization, data analysis and novel applications.
Target Participants:	Metallurgical and Material Engineers, Chemical Engineers, Biomedical Engineers, Electrical Engineers, Computer Engineers, Physicists, Chemists.
Duration:	1 Day

Activity No. 34	
CPD Title:	Quantification of wind energy potential: Feasibility to Levelized cost of Energy
Objectives:	The specific objective of this CPD is to enable the participant to perform analysis for the techno-economical potential of an area/ zone for the development of a wind energy form.
Main Contents:	1. An overview of the wind form industry on the global scale. 2. Main components of wind turbine along with cost factors. 3. Evaluation of a particular area for the potential of wind energy on the basis of wind-data. 4. Analysis of the levelized cost of wind energy production over the life cycle of the wind form, including (i) capital investment and (ii) Operation and maintenance cost.
Target Participants:	All engineering professionals
Duration:	1 Day

Activity No. 35	
CPD Title:	Machine Learning
Objectives:	Machine learning (ML) is the science of getting computers to act without being explicitly programmed.
Main Contents:	Applications of Machine Learning includes automatic speech recognition, self-driving cars, effective web search, and computer vision. These days, machine learning has become so pervasive in our lives that we use it dozens of times in a day without knowing it. Researchers think ML has potential to make progress towards human-level artificial intelligence (AI). In this workshop, we look at basics of ML and its various applications.
Target Participants:	Engineers of all Disciplines
Duration:	1 Day

Activity No. 36	
CPD Title:	Characterization Techniques for Plastics, Rubbers and Composites
Objectives:	To learn major techniques for characterization of plastics, rubbers and composites

Main Contents:	1. Thermal & thermo-mechanical characterization tecnniques 2. Material identifiication techniques 3. Data interpretation & analysis of results 4. Laboratory visit
Target Participants:	Polymer Engineers, Polymer Chemists, Rubber Technologists, Chemial Engineers
Duration:	1 Day

Activity No. 37	
CPD Title:	Economic and Statistical Evaluation of Transportation Systems
Objectives:	The objective of this course includes capacity building of participants to understand economic functioning and statistical significance of transportation systems. Furthermore this course will help the participants to understand the application of various software based statistical tools and economic evaluation of transportation systems.
Main Contents:	a. Understanding of various transportation systems; development and evolution, b. Significance of evalauting economic and statistical aspects of these systems; assessing the needs and outcomes c. Concepts, methods and techniques for evaluation d. Use of relevant software and computing tools e. Case studies of practical applications/implementation
Target Participants:	All graduates including engineers, practioners, consultants, innovators/researchers as well students related to transportation engieering and any other engineering discpline where system concepts can be applied.
Duration:	1 Day

Activity No. 38	
CPD Title:	Isolation & Structural Elucidaiton of Terpenoids
Objectives:	Terpenoids, are the most numerous and structurally diverse natural products found in many plants. The main objective is to provide the understanding about terpenoid structures and functions as several studies, preclinical, and clinical have confirmed that this class of compounds displays a wide array of very important pharmacological properties.

Main Contents:	a. Introduction, sources and uses of terpenoids b. Classification of terpenoids providing brief description of main groups c. Methods of isolation d. Structural Determination by different methods. e. Some examples exercises.
Target Participants:	The workshop is intended for Master's and PhD students and practising electrical engineers.
Duration:	1 Day

Activity No. 39	
CPD Title:	Analytical Treatment of Chamical Compounds
Objectives:	i) The objective of this lecture/Workshop is to introduce the vital importance of Various Spectroscopic, Spectrometric and Purification Techniques used for Chemical Characterization and Purification, in the field of Chemistry, Pharmacy, Natural Products etc. and their participation as informative and supportive information methods of analysis. ii) The objective of this lecture/Workshop is to provide basic knowledge about LC-MS, an important tool for separation and characterization. Most advanced analytical technique to be used for analytes separation and structural characterization to molecular level iii) The overall learning objective of this workshop is to demonstrate the principle and working of Atomic Absorption Spectroscopy. The aim is to describe the instrumentation of the instrument and its troubleshooting.
Main Contents:	i) Brief Introduction and importance of UV-Vis Spectroscopy FT-IR Spectroscopy NMR Spectroscopy Atomic Absorption Spectroscopy Mass Spectrometry for Characterization of various Molecules in the field of Chemistry, Pharmacy, Cosmetic Chemistry, Natural Products, Food Technology etc. ii) Basic introduction of Instrumentation. Introduction of various analysis modes Case Study of various analyte separation and characterization using LC-MS and MS techniques., Applications of these techniques in various industries. iii) a) Introduction to Atomic Absorption Spectroscopy b) Principle of the technique c) Discussion on its instrumentation d) Steps necessary for the analysis of metals over the instrument e) Hands – on experience over the instrument f) Data interpretation

Target Participants:	Faculty Members, Students, Biochemistry labs, Pharmaceutical industry, Food industry, Chemical Industry, Environment monitoring labs, Research Scientists, all engineering departments of university
Duration:	1 Day

Activity No. 40		
CPD Title:	Strengthening and Repair of Concrete Structures	
Objectives:	The main objective is to assess and understand the mechanism of concrete structures deterioration and devise their remedial measures. Moreover, various strengthening, repair and retrofitting techniques will be evaluated.	
Main Contents:	Mechanism for concrete structure deterioration, Structural and durability issues of concrete structures, Service life prediction, Strengthening, repair and rehabiliatation/retrofitting techniques, FRP sheets, NSM methods, Life cycle cost analysis	
Target Participants:	Civil Engineers, Assest Managers, Planning Officer, City and Regional Planner	
Duration:	1 day	

Activity No. 41		
CPD Title:	Advanced Microscopic techniques	
Objectives:	To familiarize the Graduate Engineers with Advanced Microscopic techniques so that they can use materials with right properties.	
Main Contents:	a. Basics of Microscopic techniques. b. Scanning Electron Microscopy. c. Transmission Electron Microscopy. d. Atomic Force Microscopy.	
Target Participants:	Civil Engineers, Mechanical Engineers, Metallurgical Engineers, Chemical Engineers, Electrical Engineers, Mining Engineers, Geological Engineers, Environmental Engineers, Physicists, Chemists.	
Duration:	1 day	

Activity No.42		
CPD Title:	OHS Risk Assessment and Management	
Objectives:	To make the participants able to access the OH&S Risks and devise control measures	

Main Contents:	a. Fundamentals of Safety/Risks b. Principles of Risk Assessment and Rating c. Risk Control Strategies d. Safety Management System
Target Participants:	All disciplines of engineers
Duration:	1 day

Activity No. 43	
CPD Title:	Introduction to Highway Bridge Designing
Objectives:	The main objective is to understand the calculations of various loads acting on the bridges and their cummulative effects. Furthermore, various load transfer components in bridges will be optimized. To develop awareness of bridge inspection and assessment.
Main Contents:	Various types of bridges and its load transfer components, Considertions for the load calculations, Live loading, General rules for selecting the bridge dimensions, Design of Super structure and sub structure of prestressed girder deck bridge (deck slab, girder, bearings, piers, piles, abutments etc), NHA guidelines and loadings, Condition assessment of existing bridges
Target Participants:	Civil Engineers, Structural Engineers, Transportation Engineers, Project Managers, Architects, Asset Managers
Duration:	1 day

Activity No. 44	
CPD Title:	Mathematical Modeling for Fluid Flow Problems
Objectives:	This Workshop will provide participants with hands-on experience in the mathematical modeling of fluid flow problems. It will also act as an introduction to study group (solving problems). The Engineering and science students can be benefitted in their professional field of work and Research
Main Contents:	a. Mathematical Modeling and its Applications b. Introduction to the Modeling Software c. Hands on Practice Session (Major)
Target Participants:	Engineers registered with PEC
Duration:	1 day

Activity No. 45	
CPD Title:	IR Spectroscopy of Advanced Ceramics

Objectives:	To learn the skills for better Materials Analysis
Main Contents:	1. Basics understandings of Raman spectroscopy and FTIR Anaysis. 2. Use of FTIR and Raman in ceramic bond analysis. 3. Prediction of properties of ceramics using FTIR and Raman.
Target Participants:	Open for all
Duration:	1 Day

Activity No. 46		
CPD Title:	Traffic Analysis Software Tools – Introduction and Application	
Objectives:	The overarching learning objective of this interactive workshop is to provide a broad understanding towards various traffic simulation tools used in the field of traffic engineering. . Moreover, the participants will better recognize how they can apply the techniques or both manufacturing and service sectors to get projects with reduced costs and increased productivity.	
Main Contents:	a. Introduction to why we need traffic engineering softwares b. Synchro + Simtraffic • Synchro - Introduction and an overview of the user interface, key windows, model development for a signalized intersection, background map overlays, various input parameters, signal phasing, capacity anaylsis • SimTraffic - introduction to user interface, simulation parameters, 3D model interaction c. Highway Capacity Software (HCS) • Introduction to user interface, various input and output parameters and capacity analysis d. Sidra Intersection • introduction to user interface, input parameters, model development, output parameters e. PTV Vissim • introduction to user interface, various stages of model development, input parameters, output parameters, an illustration of various traffic engineering scenarios, simulation parameters, 3D modeling environment	
Target Participants:	• All professionals including transportation engineers, traffic engineers, highway engineers and transportation planners	
Duration:	1 day	

Activity No. 47		
CPD Title:	Yellow Belt Certification in Lean Six Sigma (LSS)	

Objectives:	The overarching learning objective of this popular interactive workshop is to provide a broad understanding towards successful implementation of process improvement methods by developing familiarity with the basic concepts and language of Lean Six Sigma. Moreover, the participants will better recognize how they can apply the techniques for both manufacturing and service sectors to get projects with reduced costs and increased productivity.
Main Contents:	a. Lean Six Sigma introduction to achieve business objectives. b. 5S, waste reduction, mistake proofing and value stream mapping. d. Quality Function Deployment (House of Quality) e. DMAIC (Define-Measure-Analyze-Improve-Control) Project Model and demonstration of common process improvement tools f. Hands-on Exercises, etc.
Target Participants:	An excellent opportunity for: Engineers of all types, project managers and project team members, programme managers, project sponsors, planning advisers, technical managers, project engineers, system engineers, software systems engineers, those who are involved in the design, procurement, and implementation of technical, construction, IT, or service projects.
Duration:	1 day

Activity No.48		
CPD Title:	Fiber Reinforced & Rubberized Cement based Composites: A Sustainable Repair Materials for Thin Bonded Cement based Overlay	
Objectives:	The main objective is to assess the durability of thin bonded fiber-reinforced and rubberized cement-based overlays. Moreover, the use of digital 3D image correlation technique will be discussed for monitoring the cracking phenomena and to measure the interface debonding.	
Main Contents:	Rehabilitation of deteriorated pavements,Thin bonded cement-based overlays, Purpose of overlays, Problems in overlays, How to control debonding phenomena in overlays, mechanical characterization of fiber-reinforced and rubberized cement-based composites, Digital 3D image correlation technique, Structural performance of repaired beams.	
Target Participants:	Civil Engineers, Transportation Engineers, City and Regional Planner	
Duration:	1 day	

8Activity No. 49	
CPD Title:	Graphene and other 2-dimensional novel materials: From Fabrication to applications.

Objectives:	1 To familiarize the engineers about the Graphene and other two dimensional materials. 2 The synthesis and applications of these materials.
Main Contents:	a. Introduction to Graphene and other two dimensional materials. b. Fabrication of these materials. c. Characterization d. Applications
Target Participants:	Mechanical Engineers, Metallurgical and Material Engineers, Chemical Engineers, Electrical Engineers, Physicists, Chemists.
Duration:	1 day

Activity No. 50	
CPD Title:	Basics of Programming Logic Controllers
Objectives:	The workshop will cover all aspects of the PLCs including hardware and software.
Main Contents:	Programming logic controllers (PLCs) are most widely used equipment in industrial facilities. Its training at operational and engineering level is considered as most widely demanded skill. It is highly recommended for engineers of electrical/electronics, mechatronics, chemical and mechanical engineering disciplines.
Target Participants:	Electrical, Mechanical, Mechatronics and I&C Engineers
Duration:	1 Day

Activity No. 51	
CPD Title:	Problem Solving in Engineering Using MatLab
Objectives:	The overarching learning objective of this popular interactive workshop is to provide a broad understanding towards successful implementation of process improvement methods by developing familiarity with the basic concepts and language of Lean Six Sigma. Moreover, the participants will better recognize how they can apply the techniques for both manufacturing and service sectors to get projects with reduced costs and increased productivity.
Main Contents:	a. Lean Six Sigma introduction to achieve business objectives. b. 5S, waste reduction, mistake proofing and value stream mapping. d. Quality Function Deployment (House of Quality) e. DMAIC (Define-Measure-Analyze-Improve-Control) Project Model and demonstration of common process improvement tools f. Hands-on Exercises, etc.

Target Participants:	An excellent opportunity for: Engineers of all types, project managers and project team members, programme managers, project sponsors, planning advisers, technical managers, project engineers, system engineers, software systems engineers, those who are involved in the design, procurement, and implementation of technical, construction, IT, or service projects.
Duration:	1 day

Activity No. 52		
CPD Title:	Thermodynamic Systems for Large Thermal Power Plants	
Objectives:	The Participant will be able to design the steam turbine power plant by using the Rankine cycle and	
Main Contents:	Introduction to Thermodynamics, Basic concepts of Thermodynamic processes for gases and	
Target Participants:	Engineers registered with PEC	
Duration:	1 day	

Activity No. 53	
CPD Title:	A comprehensive workshop on fundamental concepts of Outcome Based Education (OBE). and
Objectives:	To provide a foundation to engineering academicians and help them get familiarize with Outcome Based Education (OBE).
Main Contents:	Basics of OBE, Introduction to PEOs, PLOs, CLOs, CQI, Mapping schemes, industry-academia relationship, internships, course modules, feedback, accreditation, and student facilities, PEC criteria for accreditation etc.
Target Participants:	Engineering University faculty members, consultants, Academicians, engineering educationists and researchers etc.
Duration:	1 Day

Activity No. 54	
CPD Title:	Computer Modeling for Flood Estimation and Management
Objectives:	Capacity building of professionals in use of Computer softwares for estimation of flood, its extents for damages and management.

Main Contents:	a. Rainfall runoff modeling using HEC-GeoHMS. b. Anaysis of hydrological data using statistical and stochastic techniques c. Land use land cover mapping and its use in hydrological modeling d. Digital Model application for topgraphic analysis e. Flood zoning and its maping for different flood levels using HEC-RAS and HEC-Geo RAS f. Presentaion of Case studies for flood management
Target Participants:	Civil Enineerinrs, Agricultural Engineers, Water Resources engineers, water managers, GIS professionals
Duration:	1 day

Activity No. 55	
CPD Title:	Perception of health, safety and environment, and international safe-working practices.
Objectives:	To help participants stay motivated and keep their subordinates motivated for the relevant roles and responsibilities.
Main Contents:	Basic concepts of motivation, theories of motivation; maintenance vs motivation; factors associated with motivation and moral building; etc.
Target Participants:	All engineering professionals
Duration:	1 Day

Activity No. 56	
CPD Title:	Electromagnetic Transients in Power System
Objectives:	The course is aimed to cover electromagnetic transients as the disruptive events in power systems. The computation of electromagnetic transients is a key aspect in the design, operation and analysis of modern power systems
Main Contents:	The magnitude of the operating and the associated test voltages stressing the electrical equipment will be reviewed. The electrical and physical properties of the insulation of electrical equipment in characterizing and assessing the condition of the materials will be covered. A range of non-destructive, physical and chemical diagnostic test methods will be also discussed.
Target Participants:	Electrical Engineers, control engineers and engineers of general fields
Duration:	1 Day

Activity No. 57		
CPD Title:	Water Treatment Technologies for Developing Countries	

Objectives:	intoducing water related issues and their solutions Developing Engineer's understanding on water quality based solutions using sustainable technologies
Main Contents:	1)Water sources and water quality issues 2)Treatment options and treatment protocol 3)Membrane and non-membrane based treatment 4)Supply network related issues and their solutions
Target Participants:	All graduate, postgraduate students, faculty members and Industrial professionals
Duration:	1 day

Activity No. 58	
CPD Title:	Road Safety Management (RSM)
Objectives:	The overarching aim of this interactive workshop is to develop understanding about basic concepts of road safety management.The course content shares successful practices applied worldwide and concludes with the role of Intelleigent Transport System in the context of road safety.
Main Contents:	a. What is road safety management and why do we need it?. b. The road safety profile of Pakistan. d. The systme approach - pillars of road safety e. Mobile phone usage and distracted driving f. ITS and road safety
Target Participants:	Those who want to avoid road traffic injuries and crashes in Pakistan and incoprorate basic safety principles in design and operations of road infrastructure and traffic and transport management systems:
Duration:	1 Day

Activity No. 59	
CPD Title:	Pavement Evaluation and Rehabilitation with Application of Software
Objectives:	The overarching aim of this interactive workshop is to develop understanding about basic concepts of road safety management.The course content shares successful practices applied worldwide and concludes with the role of Intelleigent Transport System in the context of road safety.
Main Contents:	Pavement Evaluation: Evaluation of the existing pavement structural and functional condition, Pavement distresses. Pavement performance, serviceability, surface friction, Nondestructive testing, Calculation of ESALs. Pavement Rehabilitation: Types of overlays, Design methodology using AASHTO procedures.

Target Participants:	Those who are involved in design and analysis of pavement system and desire to understand the latest procedures of pavement evaluation and rehabilitatioon.
Duration:	1 Day
Activity No. 60	
CPD Title:	Matlab and Simulink for Electrical Engineers
Objectives:	In this CPD course, Matlab Simulink will be discussed for electrical engineers.
Main Contents:	There will be three sessions in this workshop. First session deals with theoretical elucidation of various blocks, menu description, Simulink tool boxes and importance of command window present in MATLAB and their utilities. In this session, the attendee will be exposed to the toolkits present in POWER SYSTEMS and POWER ELECTRONICS stream. In second session selected examples will be discussed in detail related to modelling techniques, electrical machine drives, power system, control systems, power electronics and signal processing. In third session, a laboratory session will be carried out for hands on experience on Simulink Modelling and simulation of a system.
Target Participants:	Engineers of All Disciplines
Duration:	1 Day

Activity No. 61	
CPD Title:	A rigorous training on key features and building blocks for structuring the SAR for OBA .
Objectives:	To provide a rigorous training on how to adapt to Outcome Based Education (OBE) System and help improve the quality of engineering education delivered in Pakistan's engineering institutions.
Main Contents:	At the completion of this workshop the participants will be able to discuss and explain the key building blocks of OBE. The participants will be able to develop FYP, CEP, OEL and assessment schemes for different modules in accordance with OBE.
Target Participants:	Engineering University faculty members, consultants, Academicians, engineering educationists and researchers etc.
Duration:	1 Day