AMRUTVAHINI COLLEGE OF ENGINEERING, SANGAMNER

Department of Electrical Engineering

Course Outcomes (CO)

Final Year – 2015 Course			
Course Code	**Course Name**	**Course Outcomes**	
Semester - I			
(403141)	**Power System Operations and Control**	C441.1	**Identify and analyze** the dynamics of power system and suggest means to improve stability of system.
		C441.2	**Comprehend** the effect of reactive power on Power system and suggest the suitable means of reactive power management
		C441.3	**Selection** of appropriate FACTs devices
		C441.4	**Analyze** the generation-load balance in real time operation and its effect on frequency and develop automatic control strategies with mathematical relations
		C441.5	**Formulate** objective functions for optimization tasks such as unit commitment and economic load dispatch and get solution using computational techniques
		C441.6	**Evaluate** reliability indices of Power system
(403142)	**PLC and SCADA Applications**	C441.1	**Develop** block diagram of PLC and explain the working.
		C441.2	**Classify** input and output interfacing devices with PLC.
		C441.3	**Execute**, debug and test the programs developed for digital and analog operations.
		C441.4	**Applications** of PLC for developing the industrial systems
		C441.5	**Develop** architecture of SCADA and explain the importance of SCADA in critical infrastructure.
		C441.6	**Describe** various SCADA protocols along with their architecture and Observe development of various industrial applications using PLC and SCADA.

(403143)	**Elective I Power Quality**	C443.1	**Identify** importance of various power quality issues.
		C443.2	Carry out power quality monitoring
		C443.3	**List** and **explain** various causes and effects of power quality problems
		C443.4	**Analyze** power quality parameters and carry out power quality analysis
		C443.5	Select cost effective **mitigation** technique for various power quality **problems**
		C443.6	Use IEEE 519-2014 power quality standard for harmonic compliance
(403144D)	**Electric and Hybrid Vehicles**	C444.1	**Review** history, Social and environmental importance of Hybrid and Electric vehicles
		C444.2	**Describe** the performance and selection of energy storage systems
		C444.3	**Analyze** battery management system.
		C444.4	**Distinguish** between the performance and architecture of various drive trains.
		C444.5	**Describe** the different Instrumentation and Control used for electric vehicles.
		C444.6	**Differentiate** between Vehicle to Home, Vehicle to Vehicle and Vehicle to Grid energy systems concepts.
(403145)	**Control System- II**	C445.1	**Recognize** the importance of digital control system.
		C445.2	**Derive** pulse transfer function.
		C445.3	**Analyze** digital controllers.
		C445.4	**Convert** system in state space format.
		C445.5	**Solve** state equation.
		C445.6	**Design** observer for system
(403146)	**Project-I**	C446.1	**Conduct** literature search to **identify** and **formulate** the engineering problems
		C446.2	**Engage** in independent study and **apply** the mathematical, science, engineering concept and management principles necessary to **solve** the identified engineering

			problem
		C446.3	**Identify** the community that shall benefit through the solution to identified engineering problem and also **demonstrate** concern for environment
		C446.4	**Prepare** the budget for hardware requirement & Select the proper engineering tools /components for **solving** the identified engineering problem
		C446.5	**Engage** in effective written communication through the project report ,engage in effective oral communication through presentation of the project work
		C446.6	**Perform** in team ,**contribute** to the team and mentor /lead to them
(403152)	**Audit Course V (A) Hydro Energy Systems**	C453.1	**Explain** and differentiate various types of hydro electric generators; pico, micro and small hydro
Semester - II			
(403147)	**Switchgear and Protection**	C447.1	**Describe** arc interruption methods in circuit breaker.
		C447.2	**Derive** expression for restriking voltage and RRRV in circuit breaker
		C447.3	**Explain** construction and working of different high voltage circuit breakers such as ABCB, SF6 CB, and VCB.
		C447.4	**Classify and Describe** different type of relays such as over current relay, Reverse power relay, directional over current relay, Differential relay, Distance relay, Static relay and numerical relay
		C447.5	**Describe** various protection schemes used for transformer, alternator and busbar
		C447.6	**Describe** transmission line protection schemes.
(403148)	**Power Electronics Controlled Drives**	C448.1	**Explain** motor load dynamics and multi quadrant operation of drives
		C448.2	**Analyze** operation of converter fed and chopper fed DC drives.
		C448.3	**Describe** braking methods of D.C.

			and induction motor drive.
		C448.4	**Explain** vector control for induction motor drives
		C448.5	**Describe** synchronous motor drive.
		C448.6	**Identify** classes and duty cycles of motor and applications of drives in industries.
(403149)	**High Voltage Engineering**	C449.1	**Identify**, **describe** and **analyze** the breakdown theories of solid, liquid and gaseous materials
		C449.2	**Describe** as well as **use** different methods of generation of high AC, DC, impulse voltage and current
		C449.3	**Demonstrate** and **use** different methods of measurement of high AC, DC, impulse voltage and current
		C449.4	**Identify** the occurrence of overvoltage and to provide remedial solutions
		C449.5	**Demonstrate** an ability to carry out different tests on high voltage equipment and devices
		C449.6	**Design** the high voltage laboratory with all safety measures
(403150),	**Elective IV-Smart Grid:**	C450.1	**Differentiate** Conventional and Smart Grid.
		C450.2	**Identify** the need of Smart Grid, Micro Grid, Smart metering, Smart storage, Hybrid Vehicles, Home Automation, Smart Communication.
		C450.3	**Get introduced** to new upcoming concepts in electrical from Utility to Consumers.
		C450.4	**Comparing** and getting **acquainted** with emerging technologies and current professional issues in electric Grid.
		C450.5	Express the **necessity** of global smart communication system
(403151)	**Project-II**,	**C451.1**	**Perform** in team and ensure satisfactory completion of project in all respect.
		C451.2	**Apply** different tools to complete the given task and to acquire specified knowledge in area of

			interest.
		C451.3	Provide solution to the current issues faced by the society.
		C451.4	Practice moral and ethical value while completing the given task.
		C451.5	Communicate effectively findings in verbal and written forms.
403153	**Audit Course VI : Energy Storage Systems**	C453.1	**Explain** and differentiate various types of energy storage systems.