

INSTITUTE	DIPLOMA STUDIES
PROGRAM	DIPLOMA ENGINEERING (CHEMICAL ENGINEERING)
SEMESTER	5
COURSE TITLE	DCS & SCADA
COURSE CODE	09CH2505
COURSE CREDITS	1

Objective:

- 1 To learn various current automation technology and use of this technology for getting optimal output

Course Outcomes: After completion of this course, student will be able to:

- 1 Analyze current technology, automation machinery in various industries
- 2 Understand various individual and continuous hybrid process automation in industries
- 3 Select proper hardware and software for control the process

Pre-requisite of course: Basic instrumentation symbols, process control modes and techniques, sensor/ transducer, converters, final control element

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
0	0	2	0	30	20	25	25

Contents : Unit	Topics	Contact Hours
1	Introduction to DCS - History & Development Early Computer systems: Direct digital control, Centralized computer system, Distributed control Hierarchical Control: Hierarchical computer system for a large manufacturing process, overall task, detail task listing, lower level computer task, higher level computer task	0
2	DCS - Basic Packages Analog control, direct Digital control, Distributed process control, DCS configurations, Local Control Units (Relay rack mounted equipment) :Dedicated card controllers, Unit operations controllers, Multiplexers- Design, system configuration, Remote stations, Super -commutation and sub-commutation - Power supplies, - Input/ Output, - Controller file	0
Total Hours		0

Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
1	Experiment 1 DCS-Flow-sheet symbol	2
2	Experiment 2 Study of various DCS display options	2
3	Experiment 3 DCS cost estimation procedure	4
4	Experiment 4 Study of stand-alone single loop PID controller	2
5	Experiment 5 Interfacing of different devices using	4
6	Experiment 6 Study of important features of SCADA software package	4
7	Experiment 7 Study of different type of animations used in SCADA software	2
8	Experiment 8 Development of GUI using different type of scripting on SCADA software	2
9	Experiment 9 Interfacing of PLC with SCADA software package	2
10	Experiment 10 Communication of SCADA software with Ms-excel/SQL/MS-Access	2
11	Experiment 11 Interfacing of I/O modules with SCADA/ DCS package	2
Total Hours		28

Textbook :

- 1 Distributed Computer Control Systems in Industrial Automation, D. Popovic and V. Bhatkar, Marcel Dekker, 2012

References:

- 1 Process Control- Instrument Engineers Handbook, Process Control- Instrument Engineers Handbook, Bela G. Liptak, Chilton book co, 2015
- 2 Overview of Industrial Process Automation, Overview of Industrial Process Automation, KLS Sharma, Elsevier, 2017

Suggested Theory Distribution:

The suggested theory distribution as per Bloom's taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery and evaluation

Remember / Knowledge	Understand	Apply	Analyze	Evaluate	Higher order Thinking
40.00	40.00	10.00	10.00		

Instructional Method:

- 1 The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc. The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc
- 2 The internal evaluation will be done on the basis of continuous evaluation of students in the laboratory and class-room.
- 3 Practical examination will be conducted at the end of semester for evaluation of performance of students in laboratory
- 4 Students will use supplementary resources such as online videos, NPTEL videos, e-courses, Virtual Laboratory.

Supplementary Resources:

- 1 <http://coep.vlab.co.in/?sub=33&brch=97>
- 2 <http://www.idc-online.com>
- 3 <http://www.controleng.com>
- 4 <http://literature.rockwellautomation.com>