

RGPV (DIPLOMA WING) BHOPAL		OBE CURRICULUM FOR THE COURSE		FORMAT-3	Sheet No. 1/3
Branch	Cement Technology			Semester	V
Course Code	502	Course Name	Automation in Cement Manufacturing		
Course Outcome 1	Student will be able to describe the automation and automatic control system.			Teach Hrs	Marks
Learning Outcome 1	Student will be able to define the role and application of automation.			08	10
Contents	Define automation, role of automation, application of automation, advantages of automation.				
Method of Assessment	Paper pen test				
Learning Outcome 2	Student will be able to state the principle of feedback and feed forward control.			08	10
Contents	Principles of feedback and feed forward control, general performance and characteristics of instruments and instrumentation. Errors, calibration, concepts of stability and optimum control, block diagram of instrumentation system.				
Method of Assessment	Theory exam				
Learning Outcome 3	Student will be able to understand the different types of automatic control system.			08	15
Contents	On off control system, continuous control system, open loop control system, closed loop control system, transfer function of circuits and devices, proportional control, integral control, PI, PD, PID control.				
Method of Assessment	Laboratory test by observation				
Course Outcome 2	Student will be able to explain about the measuring & monitoring equipments.			Teach Hrs	Marks
Learning Outcome 1	Student will be able to describe the temperature and pressure measuring equipments.			08	10
Contents	Thermometer, Bimetallic strip, Resistance thermometer, thermocouple, thermopile, resistance temperature detectors (RTD), thermostat, radiation pyrometer, optical pyrometer, thermal camera, thermal gun. Mechanical pressure elements, pressure transducers, potential-metric device, strain gauge transducer, LVDT type transducer, variable capacitance device, piezoelectric pick up ionization gauge.				
Method of Assessment	Theory exam				

Learning Outcome 2	Student will be able to explain in brief about the level & flow controllers.	08	10
Contents	Level measurement, Different type of level controllers/Sensors, Level Sensors (Prob type), Ultrasonic level sensors, Flow, Vibration, Feed Control-Weigh Feeders, and Solid Flow Meters.C ₂ S, C ₃ A, C ₄ AF), characteristics of the compound compositions of clinker.		

Method of Assessment	Quiz		
Learning Outcome 3	Student will be able to perform the test on different measuring and monitoring devices.	08	10
Contents	Study of LVDT, RTD, thermocouple, resistance thermometer, thermistors, strain gauge, orifice assembly etc. Calibration of pressure gauge. Calibration of temperature indicator. Measurement of displacement by LVDT. Measurement of displacement by LDR.		
Method of Assessment	Laboratory test by observation		
Course Outcome 3	Student will be able to describe the effect and control of process parameters.	Teach Hrs	Marks
Learning Outcome 1	Student will be able to define the different key parameters and control in different sections of cement plant.	08	10
Contents	Key Parameters and Control in Raw Meal Preparation, Key Parameters and Control in Pyro-processing, Key Parameters and Control in Cement Grinding.		
Method of Assessment	Theory exam		
Learning Outcome 2	Student will be able to explain the interlocking of motors and trouble shooting.	08	10
Contents	Sequential interlocking for group/circuit of equipments, interlocking of equipments with process parameters, hardware and software interlocks, ladder logic, monitoring of alerts, types of alarms, trouble-shooting.		
Method of Assessment	Paper pen test		
Course Outcome 4	Student will be able to specify the quality control through automation.	Teach Hrs	Marks
Learning Outcome 1	Student will be able to draw a schematic of an On-line computerized raw mix proportioning operation.	10	10
Contents	Schematic of an on-line computerized raw mix proportioning operation, set points, key parameters, X-ray fluorescence analysis, automatic samplers, Online X-ray analysis (Robo Labs), Off-line X-ray analysis, gas proportional detectors, gas filled detector, gas flow detector, spectrometer, types of spectrometers.		
Method of Assessment	Theory exam		

Learning Outcome 2	Student will be able to make a report on operation of XRay fluorescence analysis and on-line raw mix proportioning.	10	10
Contents	X-ray fluorescence analysis, X-Ray spectrometer, and On-line raw mix proportioning operation.		
Method of Assessment	Laboratory test by observation		
Learning Outcome 3	Student will be able to follow the safety precautions during experiments.	02	05
Contents	Instructions related with safety precautions during experiments.		
Method of Assessment	Laboratory test by observation		
Course Outcome 5	Student will be able to optimize the plant operation through PLCs.	Teach Hrs	Marks
Learning Outcome 1	Student will be able to draw a block diagram for mill feed control system and explain.	08	10
Contents	Principle of control for optimizing of grinding through a computer. Feed control through pholaphone, belt conveyor motor, separator motor, fineness meter, DDC control elements, Block diagram for each feed control system.		
Method of Assessment	Theory exam		
Learning Outcome 2	Student will be able to prepare a report on optimizing cement and raw mill grinding using computer.	10	10
Contents	Block diagram for feed control system, Mill feed control through pholaphone, belt conveyor motor, separator motor, fineness meter, DDC control elements.		
Method of Assessment	Laboratory test by observation		
Learning Outcome 3	Student will be able to describe the different model for the kiln control system.	08	10
Contents	Principle of control 'Ideal Model' Vs. Adaptive Model', primary subsystem, variable required, block diagram, kiln simulator, advantages of PLCs over conventional system, use of PLCs.		
Method of Assessment	Theory exam		
Learning Outcome 4	Student will be able to draw a block diagram of fuzzy logic kiln control and hierarchial control system of kiln and describe.	08	10
Contents	Fuzzy logic kiln control, simplified flow charts for kiln control scheme and kiln control strategy according to 'Fuzzy logic'. Hierarchial kiln control, control technique of hierarchical structure and distributed intelligence, schematic of control hierarchy for a cement plant.		
Method of Assessment	Theory exam		

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code		LO Code		Format No. 4
					<i>C</i>	<i>0</i>	<i>1</i>	<i>5</i>	<i>0</i>	<i>2</i>	<i>1</i>	<i>1</i>			
COURSE NAME		Automation in Cement Manufacturing													
CO Description		Student will be able to describe the automation and automatic control system.													
LO Description		Student will be able to define the role and application of automation.													
SCHEME OF STUDY															
S. No.	Learning Content	Teaching Method	-Learning	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks							
1.	Define automation, role of automation, application of automation, advantages of automation.	Interactive teaching, demonstration, quiz, assignments.	classroom	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz to make students practice their knowledge.	08	NIL	Handouts, chalk board, PPT, text book, charts.	NIL							
SCHEME OF ASSESSMENT															
S. No.	Method of Assessment	Description of Assessment			Maximum Marks	Resources Required		External / Internal							
1.	Paper pen test	Students will be asked to describe the role and application of automation.			10	Test paper + rating scale		Internal							
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)															
Part of Progressive – I															

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code		LO Code		Format No. 4
					<i>C</i>	<i>0</i>	<i>1</i>	<i>5</i>	<i>0</i>	<i>2</i>	<i>1</i>	<i>2</i>			
COURSE NAME		Automation in Cement Manufacturing													
CO Description		Student will be able to describe the automation and automatic control system.													
LO Description		Student will be able to state the principle of feedback and feed forward control.													
SCHEME OF STUDY															
S. No.	Learning Content	Teaching Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks								
1.	Principles of feedback and feed forward control, general performance and characteristics of instruments and instrumentation. Errors, calibration, concepts of stability and optimum control, block diagram of instrumentation system.	Interactive classroom teaching, demonstration, quiz, assignments.	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz to make students practice their knowledge.	08	NIL	Handouts, chalk board, PPT, text book, charts.	NIL								
SCHEME OF ASSESSMENT															
S. No.	Method of Assessment	Description of Assessment			Maximum Marks	Resources Required	External / Internal								
1.	Theory exam	Students will be asked to state the principle of feedback and feed forward control.			10	Question paper + rating scale	External								
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)															
NIL															

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code		LO Code		Format No. 4
					<i>C</i>	<i>0</i>	<i>1</i>	<i>5</i>	<i>0</i>	<i>2</i>	<i>1</i>	<i>3</i>			
COURSE NAME		Automation in Cement Manufacturing													
CO Description		Student will be able to describe the automation and automatic control system.													
LO Description		Student will be able to understand the different types of automatic control system.													
SCHEME OF STUDY															
S. No.	Learning Content	Teaching Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks								
1.	On off control system, continuous control system, open loop control system, closed loop control system, transfer function of circuits and devices, proportional control, integral control, PI, PD, PID control.	Lab demonstration, hands on practice, lab assignments, quiz, assignments,	Teacher will demonstrate the procedure of lab experiments. The students will learn through practice.	02	06	Handout/ lab manual, text book, charts, video film.	NIL								
SCHEME OF ASSESSMENT															
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal										
1.	Laboratory test by observation	Students will be asked to describe the different types of automatic control system.	15	Observation schedule/check-list /rating scales /rubrics	Internal										
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)															
Part of Lab Work															

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code		LO Code		Format No. 4
					<i>C</i>	<i>0</i>	<i>1</i>	<i>5</i>	<i>0</i>	<i>2</i>	<i>2</i>	<i>1</i>			
COURSE NAME		Automation in Cement Manufacturing													
CO Description		Student will be able to explain about the measuring & monitoring equipments.													
LO Description		Student will be able to describe the temperature and pressure measuring equipments.													
SCHEME OF STUDY															
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks								
1.	Thermometer, Bimetallic strip, Resistance thermometer, thermocouple, thermopile, resistance temperature detectors (RTD), thermostat, radiation pyrometer, optical pyrometer, thermal camera, thermal gun. Mechanical pressure elements, pressure transducers, potential-metric device, strain gauge transducer, LVDT type transducer, variable capacitance device, piezoelectric pick up ionization gauge.	Interactive classroom teaching, tutorial, quiz, assignments.	Teacher will explain the contents and provide handouts to students. Teacher will conduct quiz/tutorial/assignments to make students practice their knowledge.	08	NIL	Handouts, chalk board, PPT, text book, charts, video film.	NIL								
SCHEME OF ASSESSMENT															
S. No.	Method of Assessment	Description of Assessment			Maximum Marks	Resources Required		External / Internal							
1.	Theory exam	Students will be asked to describe the temperature and pressure measuring equipments.			10	Question paper + rating scale		External							
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)															
NIL															

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code		LO Code		Format No. 4
					<i>C</i>	<i>0</i>	<i>1</i>	<i>5</i>	<i>0</i>	<i>2</i>	<i>2</i>		<i>2</i>		
COURSE NAME		Automation in Cement Manufacturing													
CO Description		Student will be able to explain in brief about the measuring & monitoring equipments.													
LO Description		Student will be able to explain in brief about the level & flow controllers.													
SCHEME OF STUDY															
S. No.	Learning Content	Teaching Method	-Learning	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks							
1.	Level measurement, Different type of level controllers/Sensors, Level Sensors (Prob type), Ultrasonic level sensors, Flow, Vibration, Feed Control- Weigh Feeders, and Solid Flow Meters.	Interactive teaching, tutorial, quiz, assignments.	classroom	Teacher will explain the contents and provide handouts to students. Teacher will conduct quiz/tutorial/assignments to make students practice their knowledge.	08	NIL	Handouts, chalk board, PPT, text book	NIL							
SCHEME OF ASSESSMENT															
S. No.	Method of Assessment	Description of Assessment			Maximum Marks	Resources Required		External / Internal							
1.	Quiz	Students will be asked to explain in brief about the level & flow controllers.			10	Rubrics/rating scales		Internal							
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)															
Part of Term Work															

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code		Course Code		CO Code	LO Code	Format No. 4	
					<i>C</i>	<i>0</i>	<i>1</i>	<i>5</i>	<i>0</i>	<i>2</i>		<i>2</i>
COURSE NAME	Automation in Cement Manufacturing											
CO Description	Student will be able to explain in brief about the measuring & monitoring equipments.											
LO Description	Student will be able to perform the test on different measuring and monitoring devices.											
SCHEME OF STUDY												
S. No.	Learning Content	Teaching Method	–Learning	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks				
1.	Study of LVDT, RTD, thermocouple, resistance thermometer, thermistors, strain gauge, orifice assembly etc. Calibration of pressure gauge. Calibration of temperature indicator. Measurement of displacement by LVDT. Measurement of displacement by LDR.	Lab demonstration, hands on practice, lab assignments, quiz, assignments,		Teacher will demonstrate the procedure of lab experiments. The students will learn through practice.	NIL	08	Handouts, chalk board, PPT, text book, charts, video film, Models.	NIL				
SCHEME OF ASSESSMENT												
S. No.	Method of Assessment	Description of Assessment			Maximum Marks	Resources Required		External / Internal				
1.	Laboratory test by observation	Student will be asked to perform the different test mentioned in content.			10	Observation schedule/check-list /rating scales /rubrics		External				
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)												
Part of end practical exam												

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code		LO Code		Format No. 4
					<i>C</i>	<i>0</i>	<i>1</i>	<i>5</i>	<i>0</i>	<i>2</i>	<i>3</i>	<i>1</i>			
COURSE NAME		Automation in Cement Manufacturing													
CO Description		Student will be able to describe the effect and control of process parameters.													
LO Description		Student will be able to define the different key parameters and control in different sections of cement plant.													
SCHEME OF STUDY															
S. No.	Learning Content	Teaching Method	-Learning	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks							
1.	Key Parameters and Control in Raw Meal Preparation, Key Parameters and Control in Pyro-processing, Key Parameters and Control in Cement Grinding.	Interactive teaching, assignments.	classroom quiz,	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz to make students practice their knowledge.	08	NIL	Handouts, chalk board, PPT, text book and video films.	NIL							
SCHEME OF ASSESSMENT															
S. No.	Method of Assessment	Description of Assessment			Maximum Marks	Resources Required			External / Internal						
1.	Theory exam	Student will be asked to define the different key parameters and control in different sections of cement plant.			10	Question paper + rating scale			External						
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)															
NIL															

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code		LO Code		Format No. 4
					<i>C</i>	<i>0</i>	<i>1</i>	<i>5</i>	<i>0</i>	<i>2</i>	<i>3</i>		<i>2</i>		
COURSE NAME		Automation in Cement Manufacturing													
CO Description		Student will be able to describe the effect and control of process parameters.													
LO Description		Student will be able to explain the interlocking of motors and trouble shooting.													
SCHEME OF STUDY															
S. No.	Learning Content	Teaching Method	-Learning	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks							
1.	Sequential interlocking for group/circuit of equipments, interlocking of equipments with process parameters, hardware and software interlocks, ladder logic, monitoring of alerts, types of alarms, trouble-shooting.	Interactive teaching, lab demonstration, quiz, assignments.	classroom	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz to make students practice their knowledge.	08	NIL	Handouts, chalk board, PPT, text book, charts, video film, Models.	NIL							
SCHEME OF ASSESSMENT															
S. No.	Method of Assessment	Description of Assessment			Maximum Marks	Resources Required		External / Internal							
1.	Paper pen test	Student will be asked to explain the interlocking of motors and trouble shooting.			10	Test paper + rating scale		Internal							
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)															
Part of Progressive – II															

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code		LO Code		Format No. 4			
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RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code		LO Code		Format No. 4
					<i>C</i>	<i>0</i>	<i>1</i>	<i>5</i>	<i>0</i>	<i>2</i>	<i>4</i>		<i>2</i>		
COURSE NAME		Automation in Cement Manufacturing													
CO Description		Student will be able to specify the quality control through automation.													
LO Description		Student will be able to make a report on operation of X-Ray fluorescence analysis and on-line raw mix proportioning.													
SCHEME OF STUDY															
S. No.	Learning Content	Teaching Method	–Learning	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks							
1.	X-ray fluorescence analysis, X-Ray spectrometer, and On-line raw mix proportioning operation.	Lab demonstration, hands on practice, lab assignments, quiz, assignments,		Teacher will demonstrate the procedure of lab experiments. The students will learn through practice.	04	06	Handouts, chalk board, PPT, text book, charts, video film, Models.	NIL							
SCHEME OF ASSESSMENT															
S. No.	Method of Assessment	Description of Assessment				Maximum Marks	Resources Required				External / Internal				
1.	Laboratory test by observation	Students will be asked to make a report on operation of X-Ray spectrometer and/or on-line raw mix proportioning.				10	Observation schedule/check-list /rating scales /rubrics				External				
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)															
Part of end practical exam															

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code	Course Code	CO Code	LO Code	
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				<i>C</i>	<i>0</i>	<i>1</i>	<i>5</i>	<i>0</i>	<i>2</i>	<i>4</i>	<i>3</i>	Format No. 4
COURSE NAME	Automation in Cement Manufacturing											
CO Description	Student will be able to explain in brief about the measuring & monitoring equipments.											
LO Description	Student will be able to follow the safety precautions during experiments.											
SCHEME OF STUDY												
S. No.	Learning Content	Teaching Method	–Learning	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks				
1.	Instructions related with safety precautions during experiments.	Lab demonstration, hands on practice, lab assignments, quiz, assignments,		Teacher will demonstrate the procedure of lab experiments. The students will learn through practice.	NIL	02	Handouts, chalk board, PPT, text book, charts, video film.	NIL				
SCHEME OF ASSESSMENT												
S. No.	Method of Assessment	Description of Assessment			Maximum Marks	Resources Required		External / Internal				
1.	Laboratory test by observation	Students will be asked to follow safety precautions during experiments.			05	Observation schedule/check-list /rating scales /rubrics		Internal				
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)												
Part of Lab work												

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code		LO Code		Format No. 4
					<i>C</i>	<i>0</i>	<i>1</i>	<i>5</i>	<i>0</i>	<i>2</i>	<i>5</i>	<i>1</i>			
COURSE NAME		Automation in Cement Manufacturing													
CO Description		Student will be able to optimize the plant operation through PLCs.													
LO Description		Student will be able to draw a block diagram for mill feed control system and explain.													
SCHEME OF STUDY															
S. No.	Learning Content	Teaching Method	-Learning	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks							
1.	Principle of control for optimizing of grinding through a computer. Feed control through pholaphone, belt conveyor motor, separator motor, fineness meter, DDC control elements, Block diagram for each feed control system.	Interactive teaching, lab demonstration, quiz, assignments.	classroom	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz to make students practice their knowledge.	08	NIL	Handouts, chalk board, PPT, text book, charts, video film, models.	NIL							
SCHEME OF ASSESSMENT															
S. No.	Method of Assessment	Description of Assessment			Maximum Marks	Resources Required		External / Internal							
1.	Theory exam	Student will be asked to make a block diagram for mill feed control system and explain.			10	Question paper + rating scale		External							
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)															
NIL															

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code	Course Code	CO Code	LO Code	Format No. 4
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RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code		LO Code		Format No. 4
					<i>C</i>	<i>0</i>	<i>1</i>	<i>5</i>	<i>0</i>	<i>2</i>	<i>5</i>	<i>3</i>			
COURSE NAME		Automation in Cement Manufacturing													
CO Description		Student will be able to optimize the plant operation through PLCs.													
LO Description		Student will be able to describe the different model for the kiln control system.													
SCHEME OF STUDY															
S. No.	Learning Content	Teaching Method	-Learning	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks							
1.	Principle of control 'Ideal Model' Vs. Adaptive Model', primary subsystem, variable required, block diagram, kiln simulator, advantages of PLCs over conventional system, use of PLCs.	Interactive teaching, assignments.	classroom tutorial, quiz,	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz to make students practice their knowledge.	08	NIL	Handouts, chalk board, PPT, text book, charts, video film, models.	NIL							
SCHEME OF ASSESSMENT															
S. No.	Method of Assessment	Description of Assessment			Maximum Marks	Resources Required		External / Internal							
1.	Theory exam	Student will be asked to describe the different model for the kiln control system.			10	Question paper + rating scale		External							
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)															
NIL															

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code	LO Code	Format No. 4
					<i>C</i>	<i>0</i>	<i>1</i>	<i>5</i>	<i>0</i>	<i>2</i>	<i>5</i>	<i>4</i>	
COURSE NAME	Automation in Cement Manufacturing												
CO Description	Student will be able to optimize the plant operation through PLCs.												
LO Description	Student will be able to draw a block diagram of fuzzy logic kiln control and hierarchial control system of kiln and describe.												
SCHEME OF STUDY													
S. No.	Learning Content	Teaching Method	-Learning	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks					
1.	Fuzzy logic kiln control, simplified flow charts for kiln control scheme and kiln control strategy according to 'Fuzzy logic'. Hierarchial kiln control, control technique of hierarchical structure and distributed intelligence, schematic of control hierarchy for a cement plant.	Interactive teaching,	classroom tutorial, quiz,	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz to make students practice their knowledge.	08	NIL	Handouts, chalk board, PPT, text book, charts, video film, models.	NIL					
SCHEME OF ASSESSMENT													
S. No.	Method of Assessment	Description of Assessment			Maximum Marks	Resources Required		External / Internal					
1.	Theory exam	Student will be asked to draw a block diagram of fuzzy logic and/or hierarchial control system of kiln and describe.			10	Question paper + rating scale		External					
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)													
NIL													

REFERENCES:

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3. Mechanical and Industrial Measurements – R.K.Jain – Khanna Publishers.
4. Electronic Instrumentation and Measurement Techniques – Cooper W.D. and Halftrack A.D. Prentice Hall of India Pvt. Ltd.
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10. Modern Cement Plants, World Cement.
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15. Introduction to Microprocessors, Software, Hardware, Programming by Leventhal, Prentice Hall of India.
16. Microcomputers/Microprocessors, Hardware, Software and Applications, by Hilburn and Julich, Prentice Hall of India.