

Lesson Plan

Name of the Faculty Suparna Ambesange, HOD I&C
Discipline Instrumentation and Control
Semester 5th
Subject Analytical and Environmental Instruments
Lesson Plan Duration 15 weeks(from July, 2018 to November,2018)
Work Load (Lecture/Practical) per week (in hours) : Lectures- 04, Practical- 03

Week	Lecture Day	Theory Topic (Including assignment/test)	Practical week	Practicals Topic
1st	1st	Brief introduction about subject and syllabus	1	To find conductivity of a given solution
	2nd	Fundamental blocks of analytical instruments		
	3rd	Spectroscopic analysis- Introduction		
	4th	revision		
2nd	5th	Absorption spectroscopy	2	To measure total dissolved solutions in water
	6th	NMR spectroscopy		
	7th	Mass spectroscopy		
	8th	revision		
3rd	9th	Gas analysis- Introduction	3	To measure oxygen content dissolved in water
	10th	Infra-red gas analyzer- Block dia & Principle of Working		
	11th	Paramagnetic oxygen analyzers - Block dia & Principle of Working		
	12th	revision		
4th	13th	Thermal conductivity analysis - Block dia & Principle of Working	4	Demonstration of mass spectroscopy
	14th	Assignment discussion		
	15th	Revision		
	16th	class test		
5th	17th	Test Paper Discussion	5	Demonstration of gas chromatography
	18th	Gas chromatography- Introduction		
	19th	Related instruments like injectors, oven, column		
	20th	infrared analyzer		
6th	21th	Revision	6	To measure noise level
	22th	Liquid analysis		
	23th	Principle of pH measurement		
	24th	revision		
7th	25th	Electrodes for pH measurement	7	To study spectrometer
	26th	revision		
	27th	Electrochemical analyzer		
	28th	revision		
8th	29th	class test	8	To study thermal conductivity gas analyzer
	30th	Environmental pollution monitoring instruments- Introduction		
	31st	Air quality standards		
	32nd	revision		
9th	33rd	Dust measurement	9	Viva voice
	34th	Types and measurement of concentration of various gas pollutants in atmosphere		
	35th	Electrochemical instruments		
	36th	revision		
10th	37th	Electrochemical cell	10	Viva voice
	38th	Types of electrodes		
	39th	Conductivity meters		
	40th	Aqua meters		
11th	41th	Revision	11	Viva voice
	42th	Instrumentation used for water and noise pollution and their monitoring		

	43th	Assignment discussion		
	44th	viva voice		
12th	45th	class test	12	Viva voice
	46th	revision		
	47th	Assignment discussion		
	48th	revision		
13th	49th	revision	13	Viva voice
	50th	viva voice		
	51st	revision		
	52nd	revision		
14th	53rd	Previous paper discussion	14	Viva voice
	54th	revision		
	55th	revision		
	56th	revision		
15th	57th	Previous paper discussion	15	Viva voice
	58th	revision		
	59th	revision		
	60th	revision		

Lesson Plan

Name of the Faculty : Sh. Pardeep Nandal
 Discipline : Instrumentation & Control
 Semester : 5th
 Subject : Environmental Education (3T-0P)
 Lesson plan duration : 15 weeks (from July, 2018 to Nov, 2018)

Week	Theory	
	Day	Topic
1st Week	1 st	Overview of syllabus, Reference Books, Importance of Subject, Unit – 1 : Environmental Education – Definition, Objectives
	2 nd	Scope and Importance of Environmental Education
	3 rd	Discussion of Important , expected questions in exams, homework questions
Week 2	1 st	Unit-2 : Basics of ecology- Contents of Unit, Introduction, Ecology, Ecosystem- Types, Structure/Components, Functional attributes, Characteristics
	2 nd	Food Chain- Significance, Characteristics; Food Web: Significance, Characteristics, Biological magnification, Ecological succession- Types
	3 rd	Biodiversity-Levels, Value/ Benefits/ Uses; Sustainable Development- Aspects, Measure or Strategies
Week 3	1 st	Discussion of Important , expected questions in exams, homework questions
	2 nd	Unit 3: Sources of Pollution- Introduction, Environmental Pollution, Sources/ Causes, Pollutants- Classification; Types of Pollution, Air Pollution – Causes, Pollutants
	3 rd	Air Pollution- Effects, Control
Week 4	1 st	Water Pollution- Pollutants, Sources, Effects
	2 nd	Water Pollution- Control, Soil Pollution- Sources
	3 rd	Soil Pollution - Effects, Control; Noise Pollution: Sources
Week 5	1 st	Noise Pollution: Effects, Control; Radioactivity
	2 nd	Radioactive Pollution- Sources,, Effects, Control
	3 rd	Revision of Unit-3
Week 6	1 st	Discussion of Important , expected questions in exams, homework questions
	2 nd	Unit-4 : Solid waste management- Introduction, Solid waste- Classification, Causes of increase
	3 rd	Effects of Solid waste accumulation, Solid Waste Management, Methods of Solid waste disposal- Introduction
Week 7	1 st	Methods of Solid waste disposal- Explanation, Integrated Solid waste Management 3R's concept
	2 nd	Revision of Unit-4, Discussion of Important , expected questions in exams
	3 rd	Unit-5 : Mining and Deforestation- Introduction, Mining- Methods, Effects/Impact of Mining activity
Week 8	1 st	Remedial Measures, Conservation of Minerals, Deforestation- Causes
	2 nd	Deforestation- Effects, Forest Conservation and Management, Afforestation programmes
	3 rd	Revision of Unit-4, Discussion of Important , expected questions in exams
Week 9	1 st	Unit:6- Environmental Legislation – Introduction, Water (prevention and control of pollution) Act 1974
	2 nd	Air (Prevention and Control of Pollution) Act 1981
	3 rd	Environmental Protection Act 1986, Purpose
Week 10	1 st	Environmental Impact Assessment (EIA)- Purpose, Functions

	2 nd	Stages of EIA Role and Function of State Pollution Control Board,
	3 rd	Discussion of Important , expected questions in exams and Homework Questions
Week 11	1 st	Unit:7- Role of Non-conventional Energy Resources- Introduction, Classification, Importance, Need
	2 nd	Solar Energy, Wind Energy
	3 rd	Ocean thermal and Tidal Energy, Geothermal Energy
Week 12	1 st	Biomass, Bio-energy, Biogas
	2 nd	Revision of Unit-7, Discussion of Important , expected questions in exams
	3 rd	Unit:8- Current Issues in Environmental Pollution : Introduction, Green House Effect- Mechanism, Gases
Week 13	1 st	Depletion of Ozone Layer – Mechanism, Thinning, Ozone Hole, Harmful effects
	2 nd	Acid Rain- Types, ill-effects, control
	3 rd	Global Warming- ill effects, measure to check
Week 14	1 st	Carbon credit- History, Revision of Covered contents
	2 nd	Environmental Ethics- Views , Guidelines for environmental ethics
	3 rd	Rain water harvesting- Objectives, methods
Week 15	1 st	Discussion of Important , expected questions in exams, assignment
	2 nd	Discussion of Important , expected questions in exams
	3 rd	Revision of topics that students want to discuss

Lesson Plan

Name of the Faculty : Smt. Suparna A, HOD I&C
 Discipline : Instrumentation & Control
 Semester : 5th
 Subject : ES-1
 Lesson plan duration : 15 weeks (from July, 2018 to Nov, 2018)

Week	Practical	
	Practical Lect.	Topic (including assignments /tests)
Week 1	1 st	Writing skills-Introduction
	2 nd	
Week 2	1 st	i) Official and business correspondence
	2 nd	
Week 3	1 st	ii) Job application - covering letter and resume
	2 nd	
Week 4	1 st	Practice
	2 nd	
Week 5	1 st	iii) Report writing - key features and kinds
	2 nd	
Week 6	1 st	Test on above Written skills
	2 nd	
Week 7	1 st	Oral Communication Skills- Introduction
	2 nd	
Week 8	1 st	i) Giving advice
	2 nd	
Week 9	1 st	, ii) Making comparisons
	2 nd	
Week 10	1 st	iii) Agreeing and disagreeing
	2 nd	
Week 11	1 st	iv) Taking turns in conversation
	2 nd	
Week 12	1 st	v) Fixing and cancelling appointments
	2 nd	
Week 13	1 st	Generic Skills- Stress management
	2 nd	
Week 14	1 st	Time management, Negotiations and conflict resolution
	2 nd	
Week 15	1 st	Team work and leadership qualities
	2 nd	

Lesson Plan

Name of the faculty : Mrs. Suparna Ambesange (H.O.D)

Discipline : Instrumentation and Control

Semester : Vth

Subject : Project Work

Lesson Plan Duration :15 weeks (from July,2018 to November,2018)

Work Load (Practical) Per week (in hours): Practical-03

week	Practical	
	Practical day	Topic
1 st	1 st	Introduction regarding project work Need, requirement and scope of Project
2 nd	2 nd	Formulation of groups
3 rd	3 rd	Finalization of topics
4 th	4 th	Submission of synopsis
5 th	5 th	Submission of circuit diagram
6 th	6 th	Finalization of Components and IC's
7 th	7 th	All the components assemble first in the breadboard
8 th	8 th	Testing the output
9 th	9 th	PCB fabrication
10 th	10 th	Preparation of PCB's- etching Process
11 th	11 th	Preparation of PCB's- Drilling process
12 th	12 th	Placement of components along with soldering
13 th	13 th	Testing of circuit/Troubleshooting
14 th	14 th	Submission of rough Project report
15 th	15 th	Final submission of Project along with report

LESSON PLAN

Name of Faculty : Pardeep Nandal

Discipline : Instrumentation & Control

Semester : 5th

Subject : Process Control

Work Load : 03 Hrs. Per week

Week	Lecture	Topic (Including assignments/tests)	Week	Practicals
1	1	Introduction of subject	1	Introduction about lab and equipment
	2	Introduction of subject in details		
	3	Basics of process control		
	4	process variable single and multi capacity process		
2	5	Single capacity level, pressure	2	To find the differential gap of on-off control system
	6	Temperature and flow loop system		
	7	Process lag, measurement lag		
	8	Transmission lag and dead time		
3	9	Controller modes and characteristics	3	To rig up an electronic PID controller and verify its working
	10	Concept of on-off proportional		
	11	Integral, derivative P, PI		
	12	PID controls their examples		
4	13	Merits and demerits	4	To rig up an electronic proportional controller unit.
	14	Electrical control elements		
	15	Construction and principle of operation of solenoids		
	16	Operation solenoids		
5	17	Stepper motor	5	To rig up electronic proportional integrated controller unit
	18	Limit switched		
	19	Relays		
	20	Auto transfer		
6	21	Magnetic amplifier	6	To study the characteristics and controller specification of different types of control valves and their repair and maintenance
	22	Pneumatic and hydraulic control elements		
	23	Pneumatic pressure supply		
	24	Pneumatic actuator		
7	25	Pneumatic relay	7	To study and obtain the input/output relationship of a pneumatic relay
	26	Pneumatic amplifiers		
	27	Electro-pneumatic actuators		
	28	Flapper nozzle system		
8	29	Flapper-nozzle system and bellows	8	To determine the characteristics of a control valve with positioner and without positioner
	30	Air filter and regulator		
	31	Hydraulic actuator		
	32	Hydraulic actuators and valves		
9	33	Electro hydraulic actuators	9	To study a control loop tank level control using on-off control
	34	Control valves		
	35	Principle of operation and constructional		
	36	Detail of solenoid valve		
10	37	Diaphragm operated valve	10	To study the control loop of a system for flow control
	38	Globe valve		
	39	Ball valve		
	40	Butterfly valve		
11	41	Valve positioners	11	To study the control loop of a system for pressure control
	42	Control valve characteristics		
	43	Their sizing and selection and valves		
	44	Their sizing and selection and valves		
12	45	Switches	12	To study the construction and working of a pressure switch
	46	Temperature switches		
	47	flow switches		
	48	Pressure switches		
13	49	Interlocking and sequencing circuits	13	To study the construction and working of a temperature switch
	50	Interlocking and sequencing circuits		
	51	Need of interlocks		
	52	Interlocks		
14	53	Sessional test	14	To study the construction and working of a float type of level switch
	54	Revision		
	55	Revision		
	56	Revision		
15	57	Revision	15	Revision
	58	Revision		
	59	Revision		
	60	Revision		

LESSON PLAN

***Name of the Faculty** : Mr. VIRENDER KUMAR
Discipline : INSTRUMENTATION AND CONTROL
Semester : FIFTH
Subject : PROCESS INSTRUMENTATION
Lesson Plan Duration : 15 weeks (from July, 2018 to November, 2018)

****Work Load (Lecture/ Practical) per week (in hours): Lectures-04, Practicals-03**

Week	Theory		Practical	
	Lecture Day	Topics (including Assignments/Tests)	Practical Day	Topic
1 st	1 st	Measurement of - length	1 st	Measurement of speed using Tachometer
	2 nd	-angle		
	3 rd	-area		
	4 th	working principle of - vernier calipers		
2 nd	5 th	-micrometer Measurement of Pressure	2 nd	Measurement of stress and strain using strain gauge/ load cell.
	6 th	-comparator		
	7 th	Least count of vener calipers,		
	8 th	-micrometer		
3 rd	9 th	-comparator	3 rd	Measurement of stress and strain using strain gauge/ load cell.
	10 th	Measurement of Pressure		
	11 th	Methods of pressure measurements		
	12 th	Measurement of Torque		
4 th	13 th	Methods of Torque measurements	4 th	To study the measurement system of pressure using Bouraion tube method
	14 th	Measurement of Power		
	15 th	Methods of Power measurements		
	16 th	Sessional test and assignment		
5 th	17 th	Measurement of speed	5 th	Practical viva
	18 th	Methods of speed measurements		
	19 th	Measurement of Force		
	20 th	Methods of Force measurements		
6 th	21 st	Revision	6 th	
6 th	22 nd	Measurement of Stress	6 th	Study of torsion dynamometers for measurement of torque.
	23 rd	Measurement of Strain		
	24 th	Strain gauges		

7 th	25 th	Types of Strain gauges	7 th	Study of torsion dynamometers for measurement of torque.
	26 th	gauge factor		
	27 th	load cells		
	28 th	Working of load cell		
8 th	29 th	temperature compensation	8 th	Measurement of acceleration torque by accelerometer
	30 th	revision		
	31 st	Sessional test and assignment		
	32 nd	Measurement of Motion		
9 th	33 rd	Measurement of displacement	9 th	Practical Viva
	34 th	Measurement of velocity		
	35 th	Measurement of acceleration		
	36 th	Measurement of seismic pickups.		
10 th	37 th	revision	10 th	Measurement of acceleration torque by accelerometer
	38 th	Thickness Measurement		
	39 th	Thickness measurement by using: - - Resistive method-1		
	40 th	- Resistive method-2		
11 th	41 st	Inductive method-1	11 th	Measurement of thickness using capacitive transducer
	42 nd	Inductive method-2		
	43 rd	Capacitive method-1		
	44 th	Capacitive method-2		
12 th	45 th	Ultrasonic method -1	12 th	Measurement of thickness using capacitive transducer
	46 th	Ultrasonic method-2		
	47 th	Revision		
	48 th	Measurement of Density-1		
13 th	49 th	Measurement of Density-2	13 th	To measure the pH value of given solution
	50 th	Measurement of pH-1		
	51 st	Measurement of pH-2		
	52 nd	Measurement of Humidity-1		
14 th	53 rd	Measurement of Humidity-2	14 th	To measure the pH value of given solution
	54 th	Measurement of Viscosity-1		
	55 th	Measurement of Viscosity-2		
	56 th	Revision		
15 th	57 th	Seasonal Test and Assignment	15 th	Practical Viva

LESSON PLAN

Name of the Faculty : **JAI PARKASH**

Discipline : **INSTRUMENTATION AND CONTROL**

Semester : **5th**

Subject : **POWER ELECTRONICS**

Lesson Plan Duration : **15 weeks (from July 2018 to November 2018)**

Work Load (Lecture/ Practical) per week (in hours): Lectures-03, Practicals-03

Week	Theory		Practical	
	Lecture Day	Topics (including Assignments/Tests)	Practical Day	Topic
1 st	1 st	Construction, working principles of SCR, two transistor analogy of SCR, VI characteristics of SCR	1 st	To plot VI characteristic of an SCR
	2 nd			
	3 rd	SCR specifications and ratings		
2 nd	4 th	Different methods of SCR triggering	2 nd	To plot VI characteristics of TRIAC
	5 th	Different commutation circuit for SCR		
	6 th	Series and parallel operation of SCR		
3 rd	7 th	Construction & working principle of DIAC & their V-I characteristics	3 rd	To plot VI characteristics of UJT
	8 th	Construction & working principle of TRIAC & their V-I characteristics		
	9 th	Construction, working principle of UJT		
4 th	10 th	VI characteristics of UJT	4 th	To plot VI characteristics of DIAC
	11 th	UJT as relaxation oscillator		
	12 th	Brief introduction to Gate Turn Off thyristor (GTO), Programmable uni-junction transistor (PUT), MOSFET, IGBT		
5 th	13 th	Basic idea about the selection of heat sink for thyristors	5 th	Study of UJT relaxation oscillator. And observe I/P and O/P wave forms
	14 th	Application such as light intensity control, speed control of universal motors, fan regulator, battery charger		
	15 th	Assignments and Class Test Unit 1		
6 th	16 th	Single phase half wave controlled rectifier with load (R, R-L)	6 th	Observation of wave shape of voltage at relevant point of single-phase half wave controlled rectifier and effect of change of firing angle
	17 th	Single phase half controlled full wave rectifier (R, R-L)		
	18 th	Fully controlled full wave bridge rectifier		

7 th	19 th	Single phase full wave centre tap rectifier	7 th	Observation of wave shapes of voltage at relevant point of single phase full wave controlled rectifier and effect of change of firing angle.
	20 th	Principle of operation of basic inverter circuits		
	21 st	Concepts of duty cycle, series and parallel		
8 th	22 nd	Inverters and their application	8 th	Observation of wave shapes and measurement of voltage at relevant points in TRIAC based AC phase control circuit
	23 rd	Choppers : introduction		
	24 th	Types of choppers (Class A, B, C, D). Step up and step down choppers.		
9 th	25 th	Cyclo converters: Introduction, types, basic working principle and application.	9 th	VIVA - VOICE
	26 th			
	27 th			
10 th	28 th	Dual converters: Introduction, types, basic working principle and application	10 th	All files are checked
	29 th			
	30 th			
11 th	31 st	DC drive control: half wave drives.	11 th	Varying lamp intensity and AC fan speed control
	32 nd	DC drive control: Full wave drives.		
	33 rd	DC drive control: Chopper drives		
12 th	34 th	AC drive control: Phase control	12 th	Installation of UPS system and routine maintenance of batteries
	35 th	Constant V/F operation		
	36 th	AC drive control: Cyclo converter/inverter drives		
13 th	37 th	Micro Controller based AC/DC drives control	13 th	Speed control of motor using SCRs
	38 th	Assignments and Class Test Unit 4		
	39 th	UPS, on-line		
14 th	40 th	UPS, off-line & its specifications	14 th	VIVA-VOICE
	41 st	Concept of high voltage DC transmission		
	42 nd	Concepts of SMPS		
15 th	43 rd	Assignments and Class Test Unit 5	15 th	All files are checked
	44 th	Revision/test		
	45 th	Revision/test		

LESSON PLAN

Name of Faculty : Suparna A./ Jai Parkash

Discipline : Instrumentation & Control Engg.

Semester : 5th

Subject : Soft Skill

Work Load : L-3

Lesson Plan Duration- 15 weeks (July 2018 to Nov. 2018)

Week		Theory
1	1	Career Planning-Introduction
	2	Benefits of carrer planning
	3	Guideline for choosing career
2	4	Myths about choosing a career
	5	Tips for successful career planning
	6	Developing career goals
3	7	Final thought on carrer planning
	8	Things one should know while starting career and during his career
	9	Body Language-Introduction Body Talk- voluntary and involuntary body language
4	10	Forms of body language Parts of body language
	11	Origin of body language
	12	Uses of language
5	13	Body language in building interpersonal relations body
	14	Language in building industrial realtions
	15	Reason to study body language
6	16	Empoving your body body language
	17	Types of body language
	18	Gender difference Female interest and body language Shaking hands with woman
7	19	Interpreting body language-Developing confidence with correct body language
	20	Time Management- Introudction -The 80-20rule Take a goold look at the peope around you
	21	Examine your work, sense of time management. Timeis money feature of time
8	22	Three secreto of time management. Time management matrix
	23	Analysis of time matrix-effective scheduling Grouping of activities
	24	Five steps to succesful time management. Difficulties in time managment
9	25	Evils of not planning. Time management is a myth-
	26	overcoming procrastination ways to find free time
	27	Time management tips for students interesting facts about time-ideal way of spending a day time wasters-Time savers -
10	28	reaslizing the value of time Time circle planner
	29	Stress management-Introduction, Meaning
	30	At one level stress may a positive and to performance
11	31	At one level stress may be negative and to perofrmance
	32	Effects of stress-kinds of stress
	33	Source of sttress
12	34	Few other common sources of stress
	35	Case study, Behaviour identified with stress
	36	Assessing the existance of stress
13	37	What are the signs of stress
	38	Spotting stress in you
	39	Stress management tips
14	40	Teenage stress
	41	Make the mornings memorable
	42	Topics related to gender sensilization and provision of punishment in case of violation of laws
15	43	Harasement of women at workplace
	44	Indecent portrayal of women
	45	Harassment of males by misuse of acts