SCHEMEOFCOURSEWORK

CourseTitle	:BiomedicalInstrumentation		
CourseCode	:15EC1148	LTPC	3 0 0 3
Program:	:B.Tech		
Specialization:	Information Technology		
Semester	:VIII		
Prerequisites	:ElectronicMeasurementsandInstrumentation		
Coursestowhichitisaprerequisite	:		

CourseOutcomes (Cos):

1	Tounderstandthe basic MedicalInstrumentationSystemanddifferenttypesofelectrodesusedinbio-
2	Tostudydifferentbio-signalacquisitionsystems(suchasECG,EEG,EMG).
3	Tostudytheinstrumentationconcernedwithmeasuringbloodflowandbloodpressureandphysiologicalassistingdevices.
4	Tostudyoperationtheatre,monitoringequipmentandlatestdevelopmentsinmedicalimagingsystems.
5	Patientsafetywhileusingbiomedicalequipments.

CourseOutcomesversusProgramOutcomes:

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	3	2	2	2			2		2	2
CO2	3	2	3	3	2	2			2	2	2	2
CO3	3	2	3	2	2				2	2	2	2
CO4	3	2	3		2				2		2	2
CO5	3	2	3	3	3				2	2	2	2

S-Stronglycorrelated, M-Moderatelycorrelated,Blank-Nocorrelation

AssessmentMethods:	Assignment/Quiz/Seminar/CaseStudy/Mid-Test/EndExam

Week	Topic/Contents	CourseOutcomes	Samplequestions	Teaching-Learning Strategy	Assessment Method&Schedule
1	BasicMedicalInstrumentationSystem,Staticanddynamiccharacteristicsofmedical instruments	CO1	1. ExplainaboutBasicMedicalInstrumentationSystem 2.ListStaticanddynamiccharacteristicsofmedicalinstruments	Lecture/Discussion	AssignmentI/Quiz-I/Mid-I
2	Bio-signalsandcharacteristics.Problemsencounteredwithmeasurementsfromhuman beings.	CO1	1.Mentiondifferent Bio-signals andcharacteristics 2. Whataretheproblemsencounteredwithmeasurementsfromhumanbeings	Lecture/Discussion	AssignmentI/Quiz-I/Mid-I
3	SourcesofBioelectricPotentials,RestingandActionPotentials.	CO1	1. DefineResting potential 2. DefineAction potential	Lecture/Discussion	AssignmentI/Quiz-I/Mid-I
4	Electrodepotential,Electrodeequivalentcircuit,TypesofElectrodes-SurfaceElectrodes,NeedleElectrodes,MicroElectrodes.	CO2	1. Draw electrodeequivalentcircuitandmentionitsimpedance 2. Explainaboutdifferenttypesofelectrodeswithneatdiagrams	Lecture/Discussion	AssignmentI/Quiz-I/Mid-I
5	Transducersfor BiomedicalApplications	CO2	1.Explainthe workingoftemperaturetransducers	Lecture/Discussion	AssignmentI/Quiz-I/Mid-I
6	ElectricalConductionsystemofthehearт,Electrocardiogram,ECGleads,Einthoventriangle.	CO2	1. WithaneatBlockDiagramexplaintheElectricalConductionsystemoftheheart 2. Explainabout ECGleads.	Lecture/Discussion	AssignmentI/Quiz-I/Mid-I

7	ECGamplifier,EEG10-20leadsystemandEMG..	CO2	1. WhatisEMG 2. WithneatblockdiagramexplainaboutEEG10-20leadsystem	Lecture/Discussion	AssignmentI/ Quiz-I/Mid-I
8	Bloodflowmeters-Electromagneticbloodflowmeter,UltrasonicDopplerbloodflowmeter.Bloodpressuremeasurement-Ultrasonicbloodpressuremonitoring.	CO3	1. ExplaintheworkingprincipleofElectromagneticbloodflowmeter 2. ExplaintheworkingprincipleofUltrasonicDopplerbloodflowmeter 3. ExplaintheworkingprincipleofUltrasonicbloodpressuremonitoring	Lecture/Discussion	AssignmentI/ Quiz-I/Mid-I
9	Mid-Test-1	--	---------	------	----------
10	PHYSIOLOGICAL ASSISTDEVICES &THERAPEUTIC EQUIPMENT: Pacemakers-External&internal, Defibrillators-External&internal, Hemodialysismachine	CO3	1. Explainaboutpacemakersexternalandinternaltypes 2. Explainabout Defibrillators-Externalandinternaltypes	Lecture/Discussion	AssignmentII/Quiz-II/Mid-II
11	OPERATION THEATREEQUIPMENT: Spirometry,Anesthesiamachine,Ventilators	CO4	1. Explaintheworkingprincipleofspirometer 2. Explainabout ventilators	Lecture/Discussion	AssignmentII/Quiz-II/Mid-II
12	MONITORING EQUIPMENT: ArrhythmiaMonitor, FoetalMonitor,andIncubator.	CO4	1.Explainabout ArrhythmiaMonitoringequipment 2. Describewitthediagramoperationofincubator.	Lecture/Discussion	AssignmentII/Quiz-II/Mid-II
13	MEDICALIMAGINGEQUIPMENT: X-	CO4	1. ExplaintheworkingofX-raymachine. 2. CompareComputed	Lecture/Discussion	AssignmentII/Quiz-II/Mid-II

	raymachine,ComputedTomography(CT),UltrasoundImagingsystem		Tomography(CT) andUltrasoundImagingsystem		
14	PATIENTSAFETY: ShockHazardsandPrevention,PhysiologicalEffectsandElectricalCurrent,ShockHazardsfromElectricalEquipment	CO5	1. ExplainaboutPhysiologicalEffectsofElectricalCurrent 2. Definemicroshockand macroshock.	Lecture/Discussion	AssignmentII/Quiz-II/Mid-II
15	MethodsofAccidentPrevention,IsolatedPowerDistributionSystem,Testinstrumentsforcheckingsafetyparametersofbiomedicalequipment.	CO5	1. Explainthedifferent MethodsofAccidentPrevention 2. Explainaboutthetestinstrumentsforcheckingsafetyparametersofbiomedicalequipment.	Lecture/Discussion	AssignmentII/Quiz-II/Mid-II
16	Mid-Test2	------	----------		
17	ENDEXAM	------	------		