Head Talk on

Progress in Teaching and Research

in

Dept. of Electronics and Communication Engineering

Birla Institute of Technology
Mesra, Ranchi-835 215

Growth Path of The Department

Programme	Description
UG (Electronics and Communication Eng.)	Started in 1960 with 05 seats Increased in 1984 to 45 seats Increased in 1994 to 60 seats Increased in 2000 to 120 seats
PG (Microwave) & (Instrumentation)	Both started in 1965 With 12 seats each
PG (Wireless Communication)	Started in 2005 with 18 seats

Programmes Offered by Department

Sr. No.	Level	Programme	Sanctioned strength
1	UG	Bachelor of Engineering (B.E.) Electronics & Communication Engineering - 4-years (8-semester	120
2	PG	Master of Technology (MTech) Microwave	12
3	PG	Master of Technology (MTech) Instrumentation	12
4	PG	Master of Technology (MTech) Wireless Communication	18
5	PhD	1. Microwave & Electromagnetics Engg. 2. Signal Processing and Instrumentation 3. Wireless Communication 4. VLSI Design	

Vision of the Department

To become a centre of excellence in teaching and research for creating technical manpower to meet the technological need of the country in the field of Electronics and Communication Engineering. Department exposes the undergraduate students to all fundamental and advanced technology in the field of Electronics and Communication.

Mission of the Department

- To facilitate state of the art Education and Research at Undergraduate, Post Graduate and Doctoral levels to enable to perform challenging engineering and managerial jobs in the field of Electronics and Communication Engineering.
- To build national capabilities in Technology, Education and Research in emerging areas in the field of Electronics and Communication Engineering.
- To create an environment to provide excellent Research and Development facilities to strengthen Ph.D. programmes and Research Projects.
- To provide excellent Technological Services to bridge the gap between Academics and Industry in order to fulfil the overall academic needs of the society.
- To provide high quality Course Structure in order to turn out qualified professionals to meet the engineering needs of the country.
- To develop effective Teaching Skills and the Research Potentials of the faculty members.
- To ensure All Round Development of the students and to create a platform for turning out engineering professionals who can assume leadership position in society.

List of faculty members

SL.NO	NAME	DESIGNATION	
1	Prof. Sandeep Singh Solanki	PROFESSOR & HEAD	
2	Prof. Swapan Kumar Ghorai	PROFESSOR	
3	Prof. Nisha Gupta	PROFESSOR	
4	Prof. Vibha Rani Gupta	PROFESSOR	
5	Prof. Srikanta Pal	PROFESSOR	
6	Dr. Sanjay Kumar	ASSOCIATE PROFESSOR	
7	Dr. Neela Chattoraj	ASSOCIATE PROFESSOR	
8	Dr. Vijay Nath,	ASSOCIATE PROFESSOR	
9	Dr. Aminul Islam,	ASSOCIATE PROFESSOR	
10	Dr. Sitanshu Shekhar Sahu	ASSOCIATE PROFESSOR	

List of faculty members

SL.NO	NAME	DESIGNATION
11	Dr. Kartik Mahto	ASSISTANT PROFESSOR
12	Mr. Vishal H. Shah,	ASSISTANT PROFESSOR
13	Dr. Janardan Sahay,	ASSISTANT PROFESSOR
14	Dr. Sanjeet Kumar	ASSISTANT PROFESSOR
15	Dr. Sanjaya S. Tripathy,	ASSISTANT PROFESSOR
16	Mr. Sukanta Kr. Dash	ASSISTANT PROFESSOR
17	Dr. Manoj Kumar Mukul	ASSISTANT PROFESSOR
18	Dr. Gajendra Kant Mishra	ASSISTANT PROFESSOR
19	Dr. Somnath Sengupta	ASSISTANT PROFESSOR
20	Dr. Priyank Saxena	ASSISTANT PROFESSOR
21	Dr. Dileep Kr Upadhyay	ASSISTANT PROFESSOR
22	Dr. Anjini Kumar Tiwary	ASSISTANT PROFESSOR
23	Dr. Prajna Paramita Dash	ASSISTANT PROFESSOR
24	Mr. Santashraya Prasad	ASSISTANT PROFESSOR
25	Dr. S. Sidhishwari	ASSISTANT PROFESSOR
26	Dr. Rupesh Kumar Sinha	ASSISTANT PROFESSOR
27	Dr. Kalyan Koley	ASSISTANT PROFESSOR
28	Dr. Chandreyee Sarkar	ASSISTANT PROFESSOR
29	Dr.Vimal Kr. Singh Yadav	ASSISTANT PROFESSOR
30	Dr. Deepti Gola	ASSISTANT PROFESSOR
31	Dr. Richa Mishra	ASSISTANT PROFESSOR
32	Dr. Nilanjan Biswas	ASSISTANT PROFESSOR

Adjunct/visiting Professors

Prof. S. S. Pathak , Visiting Professor

Prof. Debasis Dutta, Adjunct Professor

Eminent alumni of ECE Dept.

Niraj Sharan
BE, ECE. Batch of 1980
Aura Inc Chairman & CEO

Rohit Prasad
BE, ECE. Batch of 1997,
Amazon, “Senior Vice President and Head Scientist for Alexa, Amazon" (AI)

Abhishek Sinha
BE, ECE Batch of 1999
Eko India Financial Services Co-founder & CEO

Eminent alumni of ECE Dept.

Subhas Basu
BSc, ECE Batch of 1985
Silicon Interfaces CEO

Ashutosh Pande
BE, ECE. Batch of 1987
Arogya mHealth Pvt. Ltd.
Founder

Sanjay Nayak
BE, ECE, , 1981-85
CEO-Tejas Network

Akshay Jalan
BE, ECE 2009-2013
Founder,
AllthingsBaby.com
(Brainsmith)

Major Recruiter of ECE students

Amdocs
Deloitte Consulting India Pvt Ltd
IBM
Pricewaterhouse Coopers (Pwc)
Samsung R&D Institute
Synopsys
CGI
Fastenal India Sourcing
Jio Platforms Ltd.
KPMG
NXP

UG, PG and PhD Students' Details

Level/ Discipline	Gender	2020-2021	2019-2020	2018-2019	2017-2018	2016-2017
UG	Male	121	110	104	97	90
	Female	10	11	14	20	26
	Total	131	**121**	**118**	**117**	**116**
PG (Microwave)	Male	00	00	00	3	7
	Female	00	00	00	2	3
	Total	**00**	**00**	**00**	**5**	**10**
PG (Wireless Communication)	Male	05	04	04	5	5
	Female	13	08	03	8	9
	Total	**18**	**12**	**07**	**13**	**14**
PG (Instrumentation)	Male	02	00	01	3	3
	Female	03	00	03	4	7
	Total	**05**	**00**	**04**	**7**	**10**

Level/ Discipline	Gender	2020-2021	2019-2020	2018-2019	2017-2018	2016-2017
PhD Students Enrolled	Male	4	4	5	11	8
	Female	9	6	2	2	3
	Total	13	**10**	**7**	**13**	**11**
PhD Submitted	Male	7	8	8	2	9
	Female	4	4	0	2	1
	Total	**11**	**12**	**8**	**4**	**10**
PhD Awarded	Male	12	3	8	6	2
	Female	4	1	3	1	0
	Total	**16**	**4**	**11**	**7**	**2**

Level/ Discipline	Gender	Total number of PhD Scholar (Presently)
Total no. of PhD Scholar	Male	47
	Female	21
	Total	**68**

Details of Completed External Funded R & D and Consultancy Projects

Sr. No	Project Title	PI/Co-PI/Collaborator (if any)	Funding agency	Date of Sanction	Sanctioned Amount	Date of Completion of the Project
1	Establishment of National MEMS Design Centre	Dr. Neela Chattoraj	ADA (Ministry of Defence)	Oct. 2010	11.16 Lakhs	Oct. 2014
2	Embedded Fiber Optic Sensor based Instrumentation System for Structural Health Monitoring	Prof. S. K. Ghorai	ISRO (Under Respond)	23 June 2009	15.49 Lakhs	05 March 2013
3	Microstrip Antenna for Wearable Applications	PI: Prof. V. R. Gupta Co-PI: Prof. Nisha Gupta	AICTE	22 July 2009	6 Lakhs	2012
4	Design of Ultra Low Power CMOS Cell for Temperature Sensor in VLSI	Dr. Vijay Nath	DST New Delhi & DRDL Hyderabad	13 June 2011	26.6 Lakhs	30 May 2015
5	Design of VLSI Design Course (Padagogy), Pilot Phase	Dr. Vijay Nath	MHRD New Delhi	June 2010	3.6 Lakhs	2013
6	Health Care Monitoring for Rural People	Mr. Vishal H. Shah	IEI	Aug. 2011	0.6 Lakh	2012

Sr. No	Project Title	PI/Co-PI/Collaborator (if any)	Funding agency	Date of Sanction	Sanctioned Amount	Date of Completion of the Project
7	Establishment of Entrepreneurship Development Cell	Co-PI: Mr. Vishal H. Shah	AICTE	2011	7 Lakhs	March 2015
8	Sample Testing and Certification of Laptop	Prof. S.S. Solanki	Dept. of IT Govt. of Jharkhand	20 March 2014	0.29 Lakhs	27 Sept. 2014
9	Designing and Developing Proximity Sensing System for Mining Trucks and other Equipment	PI: Prof S. K. Ghorai Co-PI: Dr. S.S. Tripathy	S D Engenderers	10 Aug. 2015	0.7 Lakhs	Dec.2015
10	Speech-based Access of Agricultural Commodity Prices and Weather Information in 12 Indian Languages/Dialects (Automatic Speech Recognition (ASR) Consortium-Phase II)	Prof. Mahesh Chandra	DEITY	21 July 2014	31.82 Lakhs	2 Yrs
11	Studies on Microwave Dielectric Ceramics and their devices applications	Co-PI: Prof V. R. Gupta & Prof. N. Gupta	DST (SERB)	20 May 2013	31.72 Lakhs	2015 (2 Yrs)
12	Design of VLSI Design Course (Pedagogy), Main Phase	PI: Dr. Vijay Nath Co-PI: Dr. R. K.Lal	MHRD New Delhi	Dec. 2013	6.4 Lakhs	3 Yrs

Sr. No	Project Title	PI/Co-PI/Collaborator (if any)	Funding agency	Date of Sanction	Sanctioned Amount	Date of Completion
13	Detection of Malaria Parasite from Blood Sample using Image Processing and Foldscope	PI: Dr. S. S. Tripathy	DBT Govt of India New Delhi	April 2018	8.0 Lakhs	Aug. 2019
14	Studies on Ferromagnetic - Ferroelectric Composites and Their Electronic Applications	Co-PI: Prof V. R. Gupta & Prof. N. Gupta	DST	2009	15.796 Lakhs	3 Yrs
15	Developments of Nano crystalline high permittivity lead free materials for microwave applications	Co-PI: Prof. N. Gupta	DST	2007	23.35,471 Lakhs	2010 (3 Yrs)
16	Synthesis, dielectric and optical properties of rare earth doped lead free BZT relaxor ceramics	Co-PI: Prof. N. Gupta	UGC	2010	9.828 Lakhs	2013 (3Yrs)
17	Design and Development and Characterization of Magneto-optic Material Based Current Sensor for Industrial Application	Co-PI: Prof. S. K. Ghorai	DST, New Delhi	Jan 2010	25.55 Lakhs	June 2014 (4.5 Yrs)

Contd…

Details of Ongoing External Funded R & D and Consultancy Projects

Sr. No	Project Title	PI/Co-PI/Collaborator (if any)	Funding agency	Date of Sanction	Sanctioned Amount	Duration of the Project
1	MEMS based Piezoelectric Energy Harvester for Implanted Medical Devices	PI: Dr. Sudip Kundu Co-PI: Dr. N Chattoraj	SERB	10 Jan. 2017	40 Lakhs	3 Yrs
2	Computational Identification and validation of genome wide protein-protein interaction network in rice and rice blast	PI : Dr. S. S. Sahu	SERB	03 April 2017	22 Lakhs	03 Yrs
3	Design of Ultra Low Power CMOS Temperature Sensor for Aerospace Applications	Dr. Vijay Nath	Respond, ISRO,	30 April-2015	25 Lakhs	6 Yrs
4	Study of HEMT and its performance in amplifier circuit	PI: Aminul Islam	DRDO	04 July 2017	23.742 lakh	3.5 Yrs
5	Electroencephalogram based Sleep Stages Detection using Advance Wavelet Techniques	Co-PI : Dr. S. S. Sahu	NPIU, MHRD, Govt. of India	18 June 2019	14.42 Lakhs	2 Yrs
6	'Proximity Sensor System', for Mining Applications	PI: Prof. S K. Ghorai Co-PI : Dr. S.S. Tripathy	Rizitek India Pvt. Ltd.	20 July 2020	2.08 Lakhs	1 Yr
7	Pebrin disease identification using image processing	Dr. S.S. Tripathy	CTCRI, Ranchi	Dec 2021	1.0 lakh	6 months(pilo

Institute Project

Sr. No	Project Title	PI/Co-PI/Collaborator (if any)	Funding agency	Date of Sanction	Sanctioned Amount	Duration of the Project
1	NM-ICPS Project under the Vertical: Data Science, Big Data Analytics and Data Curation.	PI : Prof S K Ghorai, CO-PIs: Dr K K Senapati, Dr S S Tripathy, Dr S Senguta, Dr G K Mishra, Dr S S Sahu	DST, GOI.	6/8/2020	Rs 100 crores for the three institutes: ISI Kolkata, BIT Mesra and COE Pune.	5 Yrs

Departmental Projects

1. Special Assistance Programme (SAP) at the level of Department Research Support (DRS), UGC, New Delhi, 31.5 Lakh+20 Lakh+5Lakh, 2004-2009

2. "Special Assistance Program-II (SAP-II) for UG Projects, sanctioned by UGC. Sanctioned Amount: Rs. 52.5 Lakh, 1st April 2009 to 31st March 2014

3. Improvement of S & T Infrastructure in Universities and higher educational Institutions (FIST), Dept. of Science and Technology, 35 Lakh, 2004-2009

4. Modernization of Instrumentation Laboratory, Prof. S.C.Goel (PI) & Prof. S. S. Solanki (Co-PI),); MODROBs, AICTE New Delhi, 2002 to 2005

5. Modernization of CMOS and Compound Semiconductor Devices and Circuit Laboratory; Dr. S.Pal (PI) & Dr. Vijay Nath (Co-PI/ Dept. Coordinator); MODROBs, AICTE New Delhi;, Sanction Date: 30th Dec. 2019; Amount: Rs.6.80/19.6 lakhs; Date of expected completion: 30th Dec 2022

Collaborations with other Institute/industry/company

- University of Antioquia, Medellin, Antioquia, Colombia
- Voice & Speech Systems, Bangalore, Karnataka
- Central Taser Research and Training Institute, Ranchi
- CRPF training institute, Ranchi
- Advance Tech India Limited, Chandigarh
- Rizitek India Private limited, Ranchi

Labs in the department

SL No.	Name of the Lab	Utilised by
1	Basic Electronics Lab	All UG 1st year students
2	Digital Electronics Lab	All UG circuit branch students
3	Microprocessor Lab	UG ECE
4	Communication Lab	
5	Advance Communication Lab	UG and PG and PhD
6	Instrumentation lab	UG and PG
7	Advance Instrumentation Lab	PG and PhD
8	Microwave Lab	UG and PG and PhD
9	Fibre optic lab	UG and PG
10	Fibre optic research lab	UG and PG and PhD
11	Antenna Lab	PG and PhD
12	VLSI lab	UG and PG and PhD
13	Embedded System Lab	UG and PG and PhD
14	Signal Processing Lab	UG and PG and PhD
15	MIC lab	UG and PG and PhD
16	Circuit simulation lab	All UG 1st year students
17	Wireless Communication Lab	PG and PhD

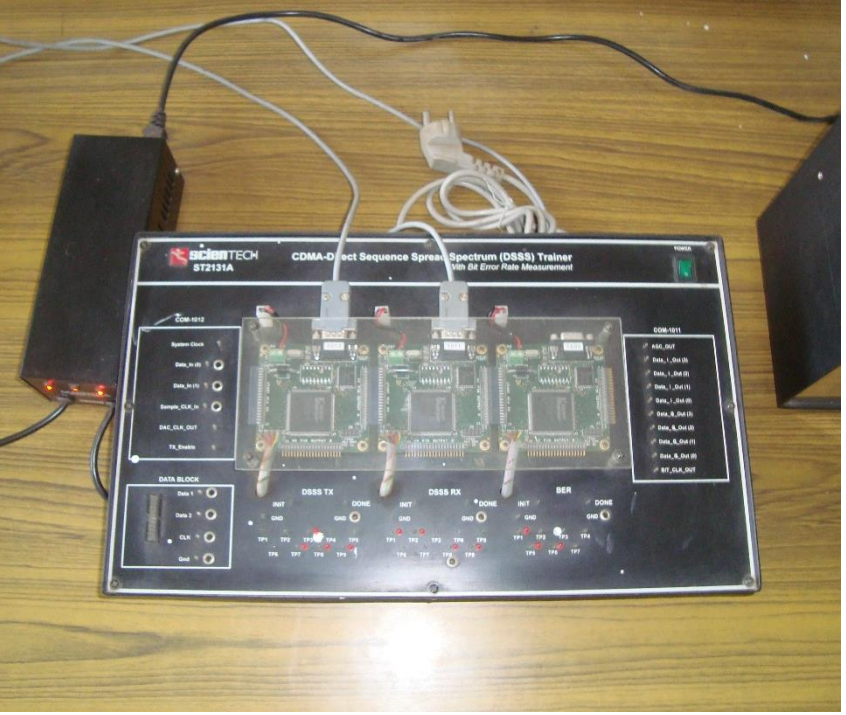
Advanced Communication Lab

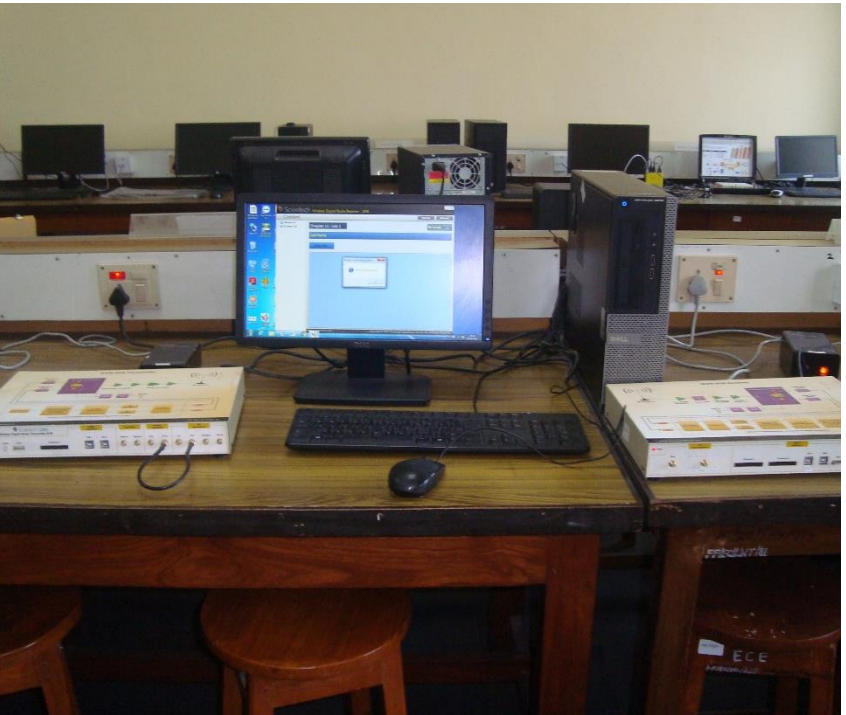
CDMA Trainer
IBM

Scientech
Understanding of 3G Communication Systems
Scientech 2138A
Understanding of 3G Communication System

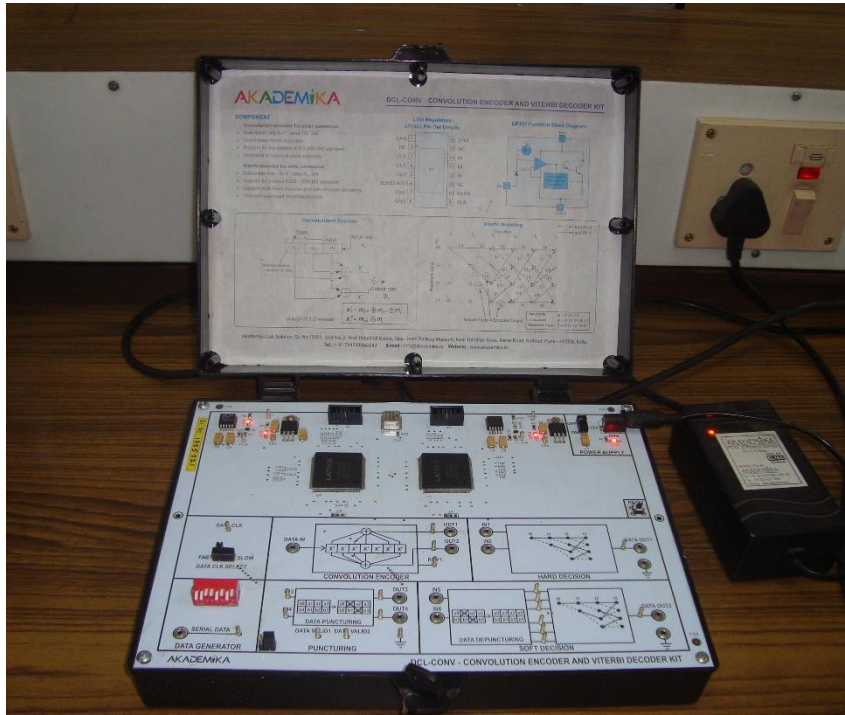
acer

CDMA Trainer
AKADEMIKA NL-LTS LOCAL AREA NETWORK TRAINER
BUS TOPOLOGY
STAR TOPOLOGY
RING TOPOLOGY
HUB


ST2131A
DSSS TX
DSSS RX
BER
DATA BLOCK



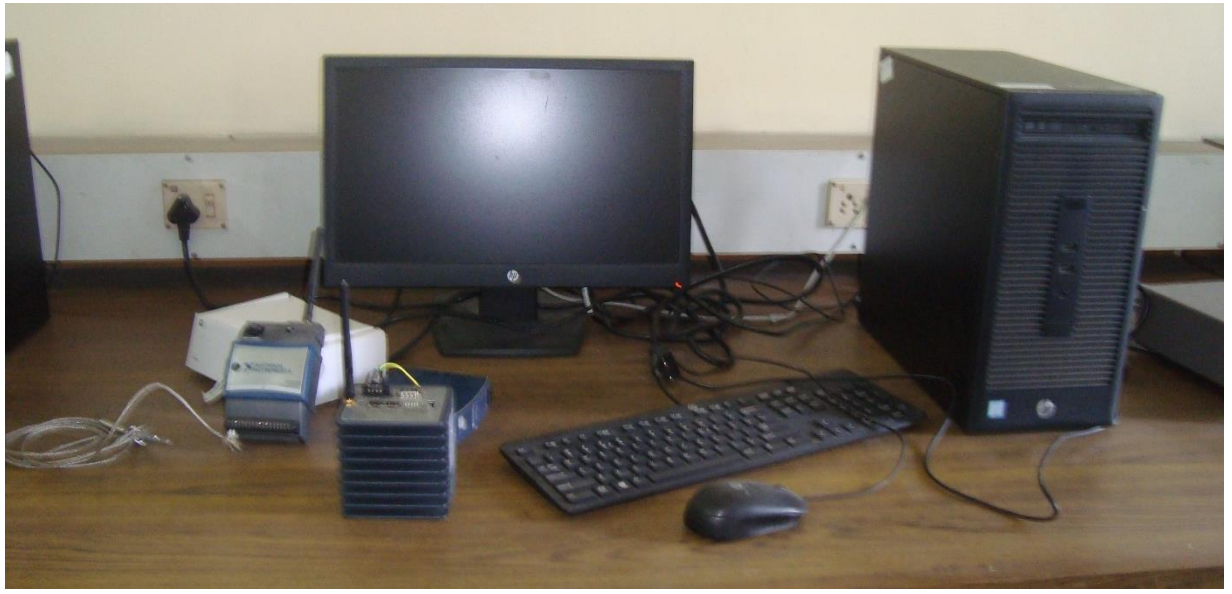
AKADEMIKA
AKADEMIKA
POWER SUPPLY
MHT POWER SUPPLY
MHT


AKADEMIKA
DCL-CONV - CONVOLUTION ENCODER AND VITERBI DECODER KIT
CONVOLUTION ENCODER
HARD DECISION
DATA PUNCTURING
DATA DEPUNCTURING
SOFT DECISION
DATA GENERATOR
PUNCTURING
AKADEMIKA
DCL-CONV - CONVOLUTION ENCODER AND VITERBI DECODER KIT

Advanced Instrumentation Lab

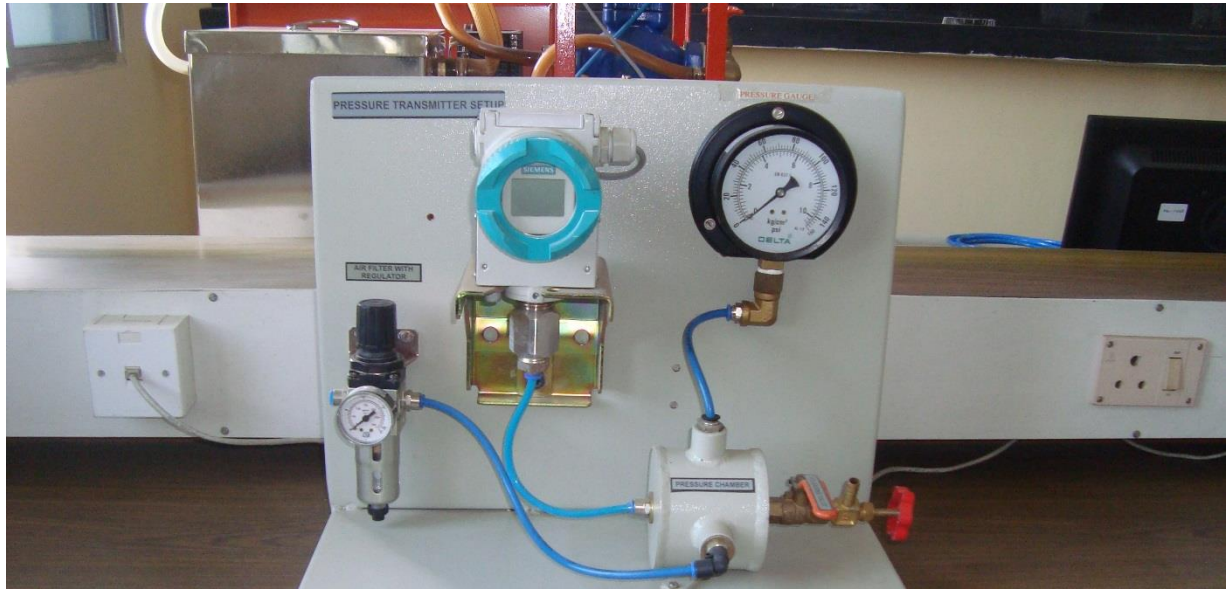
For PG Students and UG students

MICROPLAN
PATHOLOGICAL MICROSCOPE



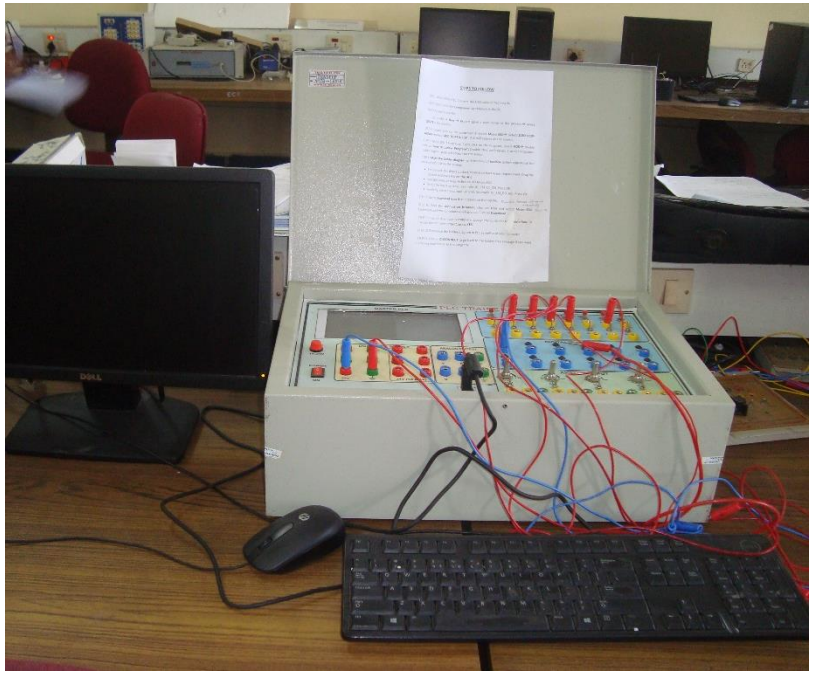
FLOW MEASUREMENT TRAINER USING ORIFICE

ENGINEER

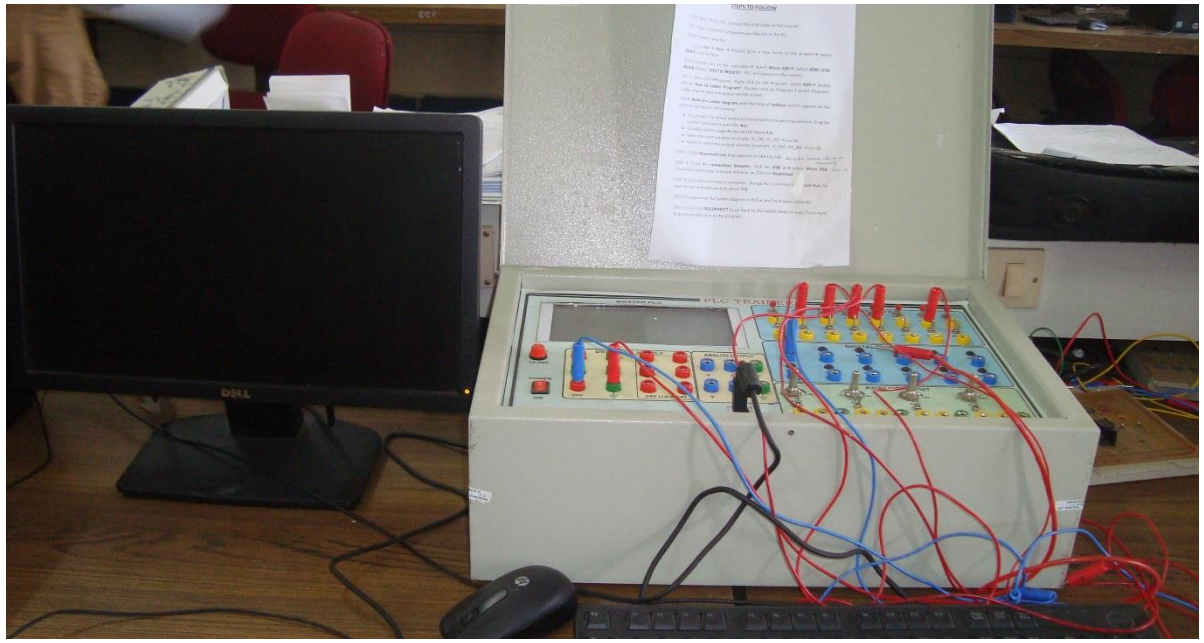

PRESSURE TRANSMITTER SETUP
SIEMENS
DELTA
AIR FILTER WITH REGULATOR
PRESSURE CHAMBER

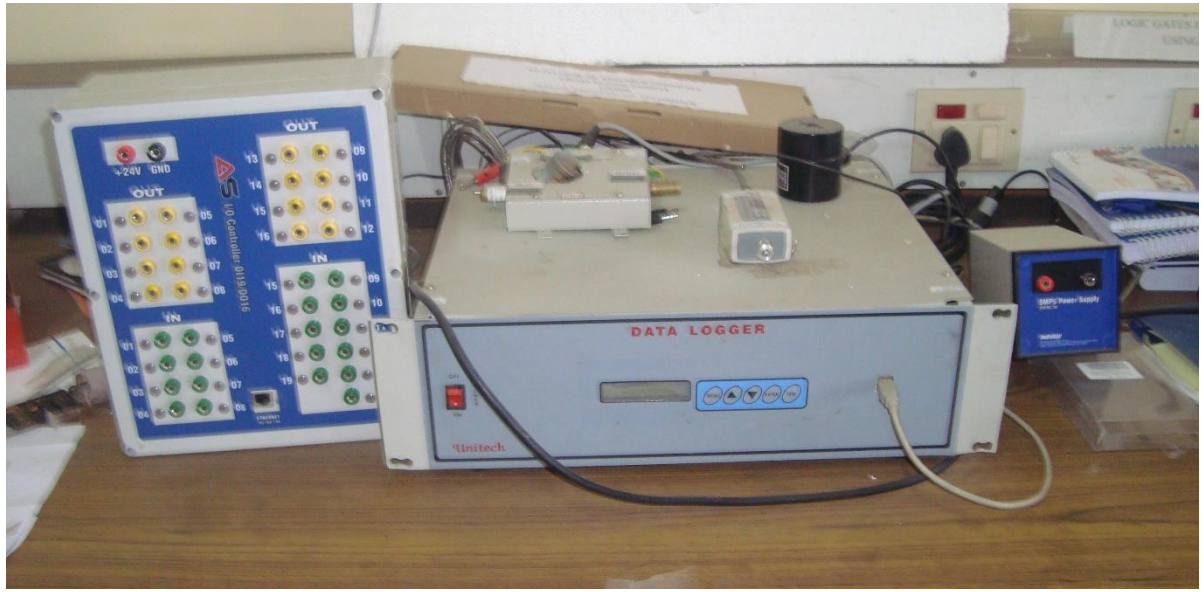
LEVEL LOOP CONTROL TRAINER
PROCESS INDICATOR
SV9 DIGITAL METER
CONTROLLER INPUT
I TO P CONVERTER
MOTOR ON
INSTRUMENT ON
AIR INPUT

AIR MASTER
COMPRESSOR COMPANY
SINCE 30 YEARS
TESTED ON


DELL

MITSUBISHI TRAINER
(FX0N - 60MR - ES)
INPUT UNIT
OFF
ON
INDICATOR
FUSE
24 VOLT
0 VOLT
OUTPUT UNIT

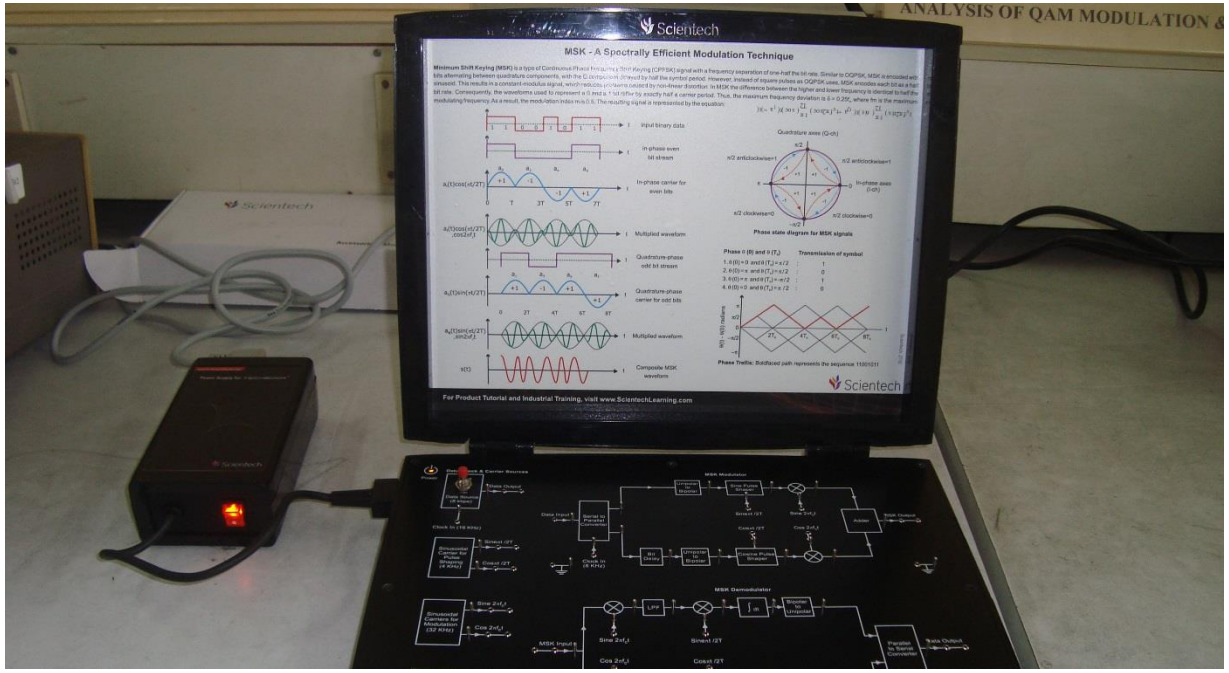

PLC TRAINER

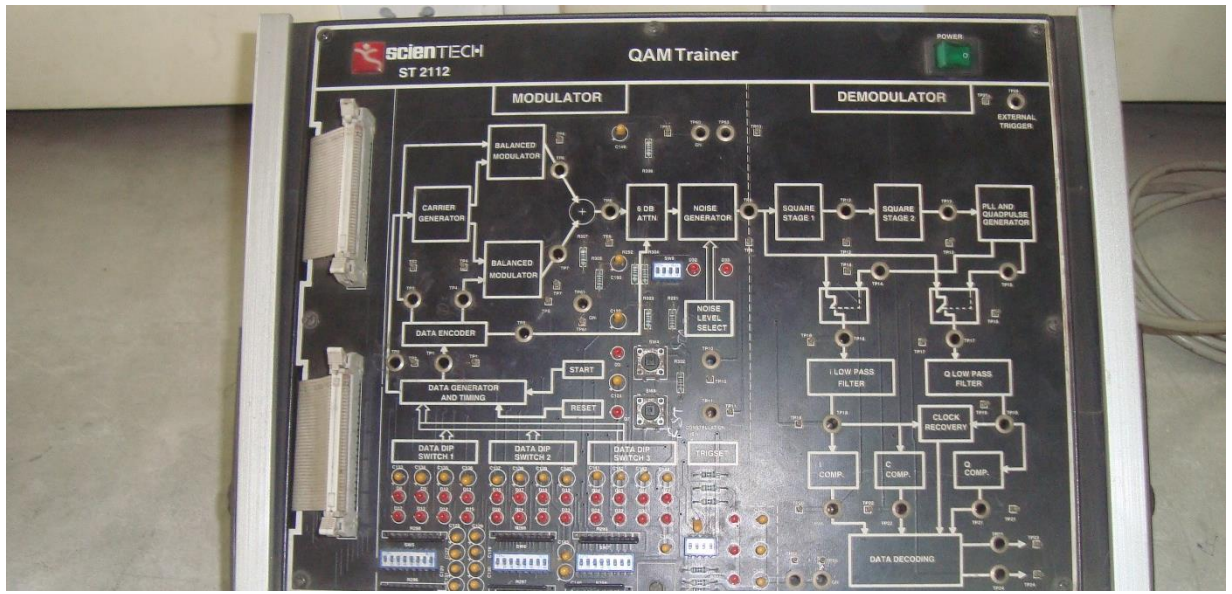

OUT
+24V GND
OUT
IN
IN
DATA LOGGER
Unitech

ADVANCE
INSTRUMENTATION
LAB

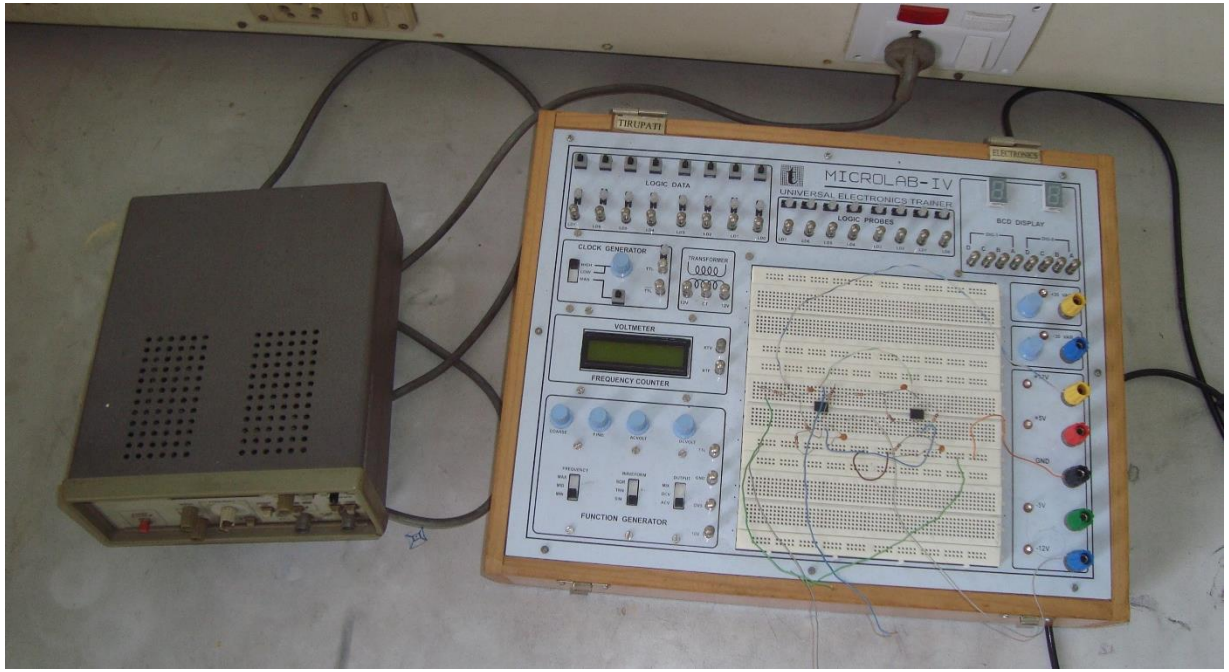
Communication System Lab

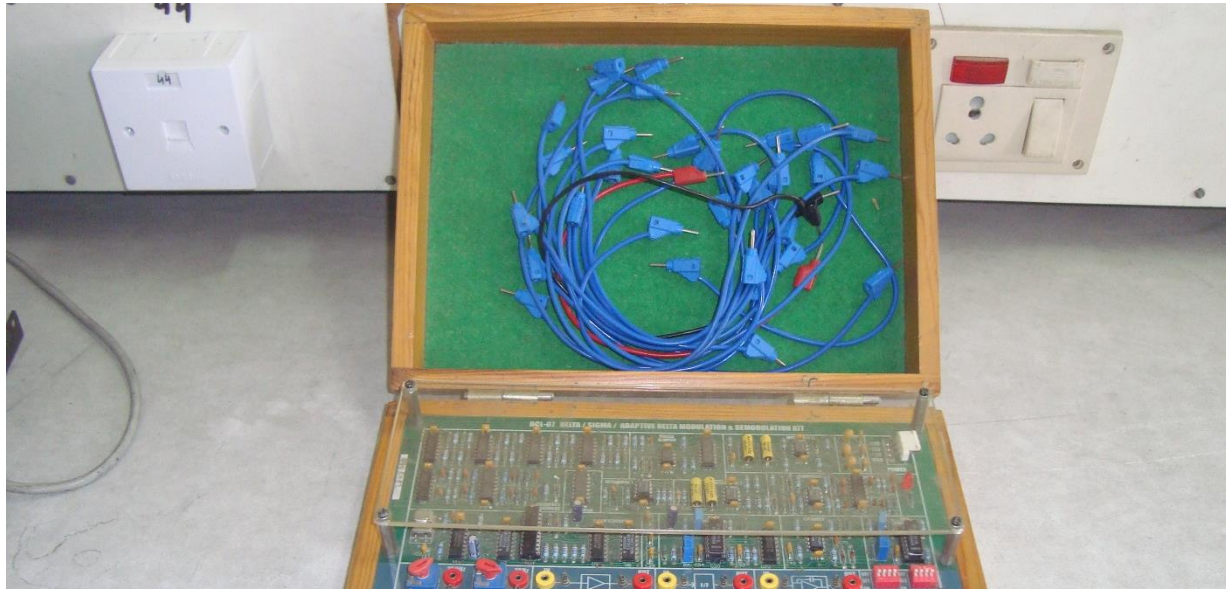
FALCON
ACL-01
AMPLITUDE MODULATION TRANSMITTER KIT
ANALOG
COMMUNICATION LAB


Scientech
MSK - A Spectrally Efficient Modulation Technique
For Product Tutorial and Industrial Training, visit www.ScientechLearning.com
ANALYSIS OF QAM MODULATION &


scienTECH
ST 2112
QAM Trainer
MODULATOR
DEMODULATOR
BALANCED MODULATOR
CARRIER GENERATOR
8 DB ATTN.
NOISE GENERATOR
SQUARE STAGE 1
SQUARE STAGE 2
PLL AND QUADPULSE GENERATOR
EXTERNAL TRIGGER
DATA ENCODER
NOISE LEVEL SELECT
START
RESET
DATA GENERATOR AND TIMING
I LOW PASS FILTER
Q LOW PASS FILTER
CLOCK RECOVERY
DATA DIP SWITCH 1
DATA DIP SWITCH 2
DATA DIP SWITCH 3
TRIGGER
COMP.
DATA DECODING

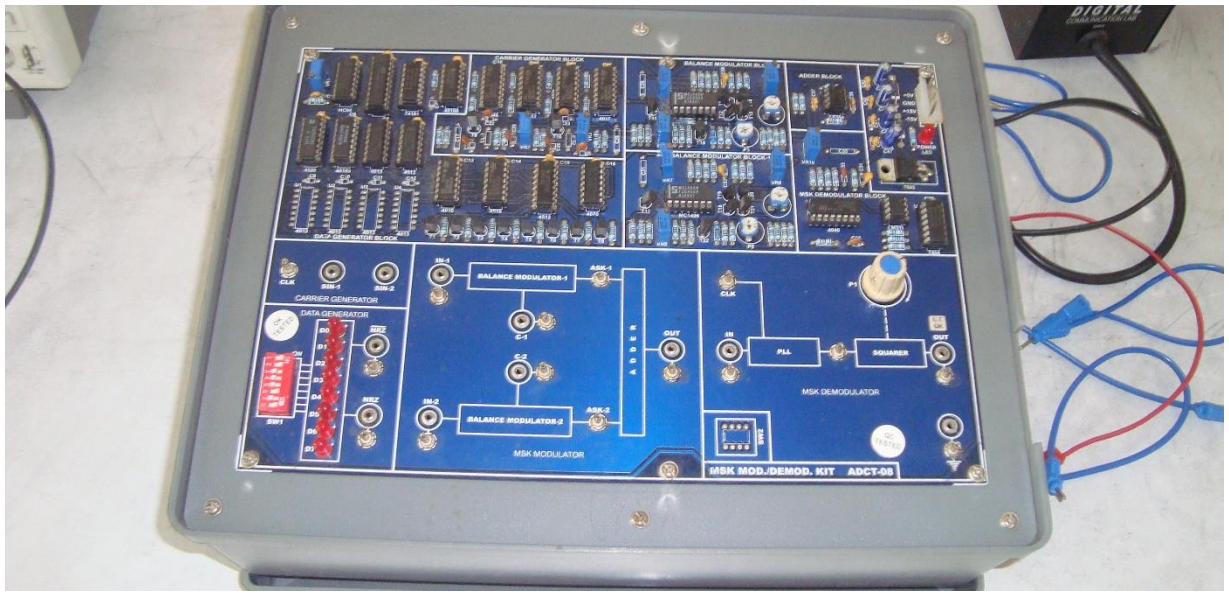
DCL - 03 PULSE CODE MODULATION TRANSMITTER KIT.
DCL - 04 PULSE CODE DEMODULATION RECEIVER KIT.

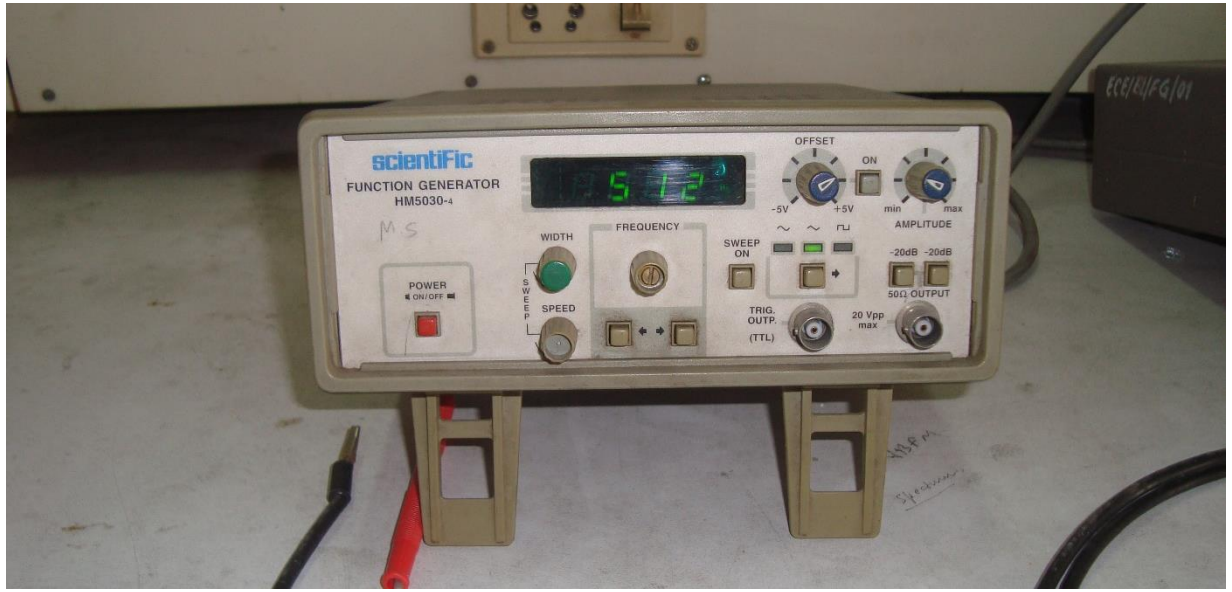

TIRUPATI
MICROLAB-IV
UNIVERSAL ELECTRONICS TRAINER
LOGIC DATA
LOGIC PROBES
BCD DISPLAY
CLOCK GENERATOR
VOLTMETER
FREQUENCY COUNTER
FUNCTION GENERATOR

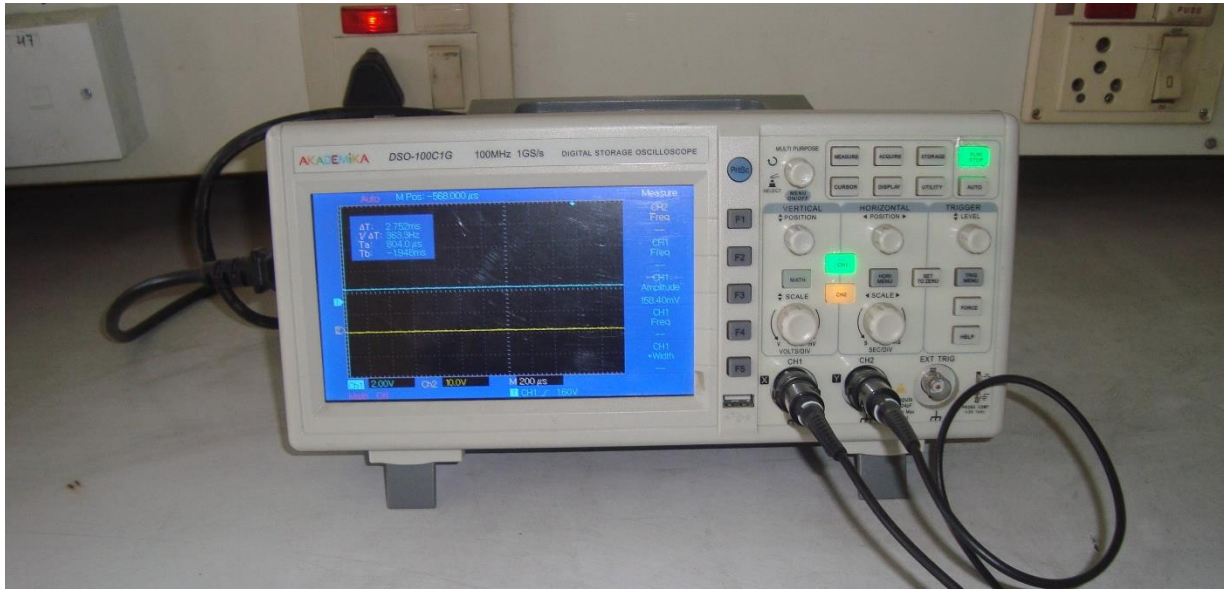


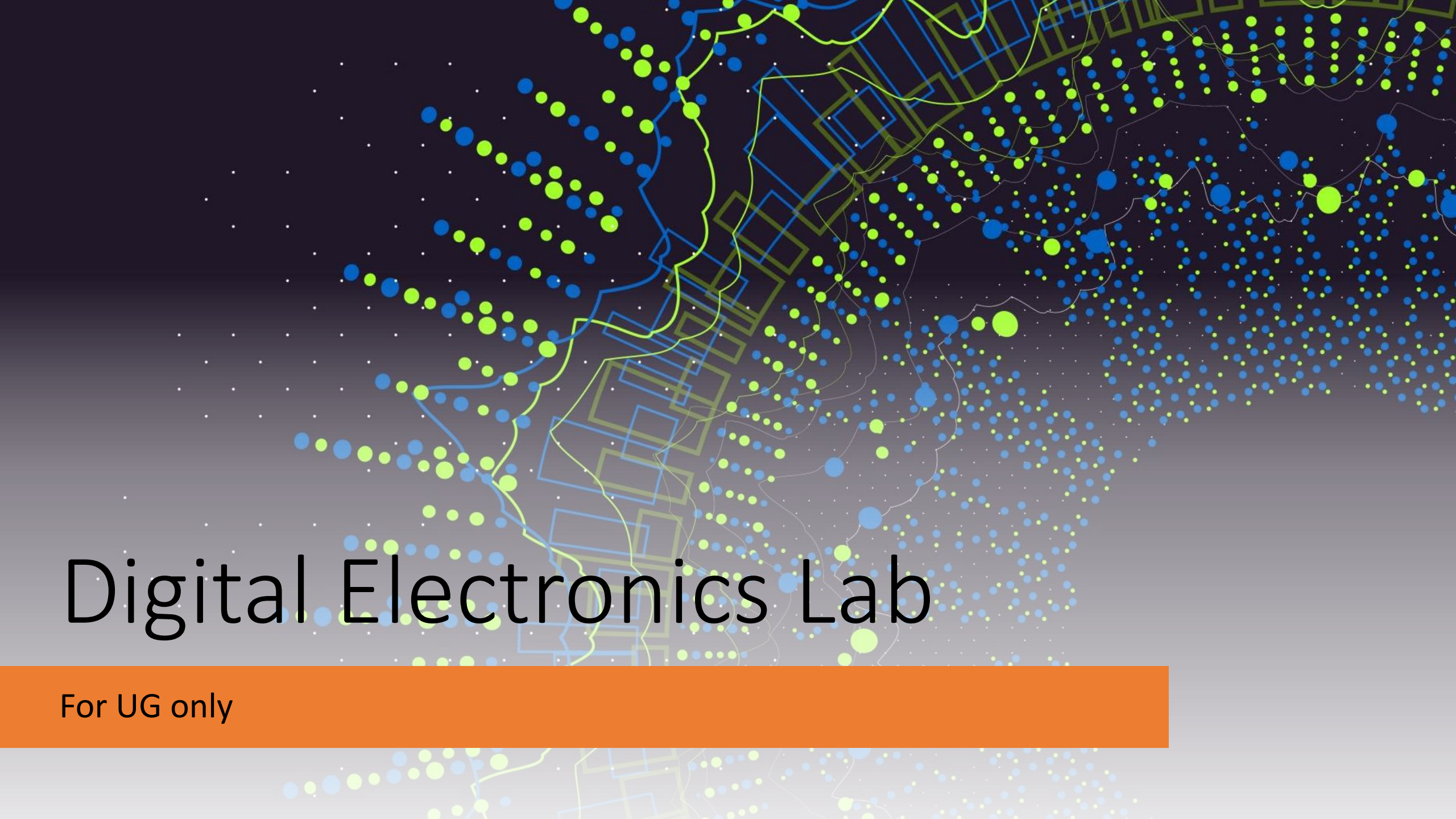
DIGITAL COMMUNICATION LAB
DELTA MODULATOR
DELTA DEMODULATOR
SECOND ORDER FILTER
FOURTH ORDER FILTER
INPUT BUFFER
CVSD MODULATOR
CVSD DEMODULATOR
COMPANDER
OUTPUT BUFFER
EXPANDER
SAMPLING FREQUENCY
FREQUENCY GENERATOR
RESET
DELTA/ADAPTIVE DELTA MODULATOR & DEMODULATOR KIT
ACT-06

10000
WAVE
SHIFT
POWER
FREQUENCY
DUTY
OFFSET
AMPL
OUTPUT
GW INSTEK SFG-1013
DDS Function Generator


DIGITAL COMMUNICATION LAB
CARRIER GENERATOR
DATA GENERATOR
BALANCE MODULATOR-1
BALANCE MODULATOR-2
ADDER
MSK MODULATOR
PLL
SQUARER
MSK DEMODULATOR
MSK MOD./DEMOD. KIT ADCT-05


scientific
FUNCTION GENERATOR
HM5030-4
POWER
ON/OFF
WIDTH
SPEED
SWEEP
FREQUENCY
OFFSET
ON
-5V
+5V
min
max
AMPLITUDE
SWEEP ON
-20dB
-20dB
50Ω OUTPUT
TRIG. OUTP. (TTL)
20 Vpp max


ACADEMIKA
DSO-100C1G
100MHz 1GS/s
DIGITAL STORAGE OSCILLOSCOPE
VERTICAL
HORIZONTAL
TRIGGER
CH1
CH2
EXT TRIG



Digital Electronics Lab

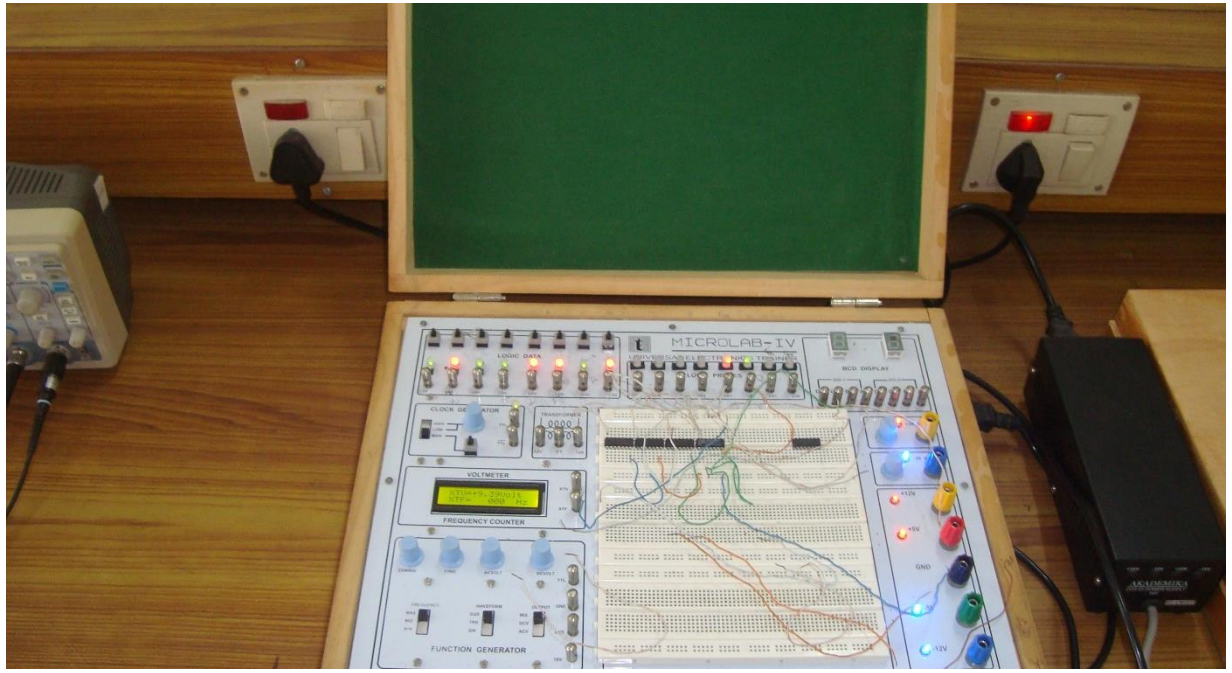
For UG only

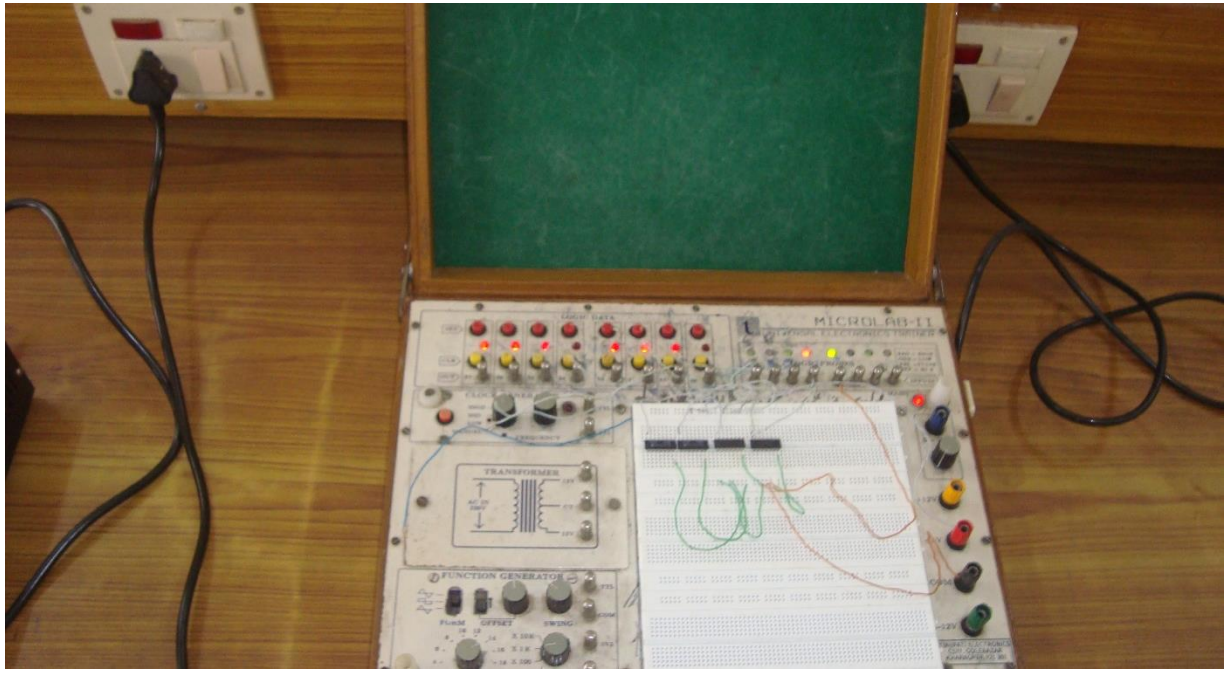
249

249

ECE

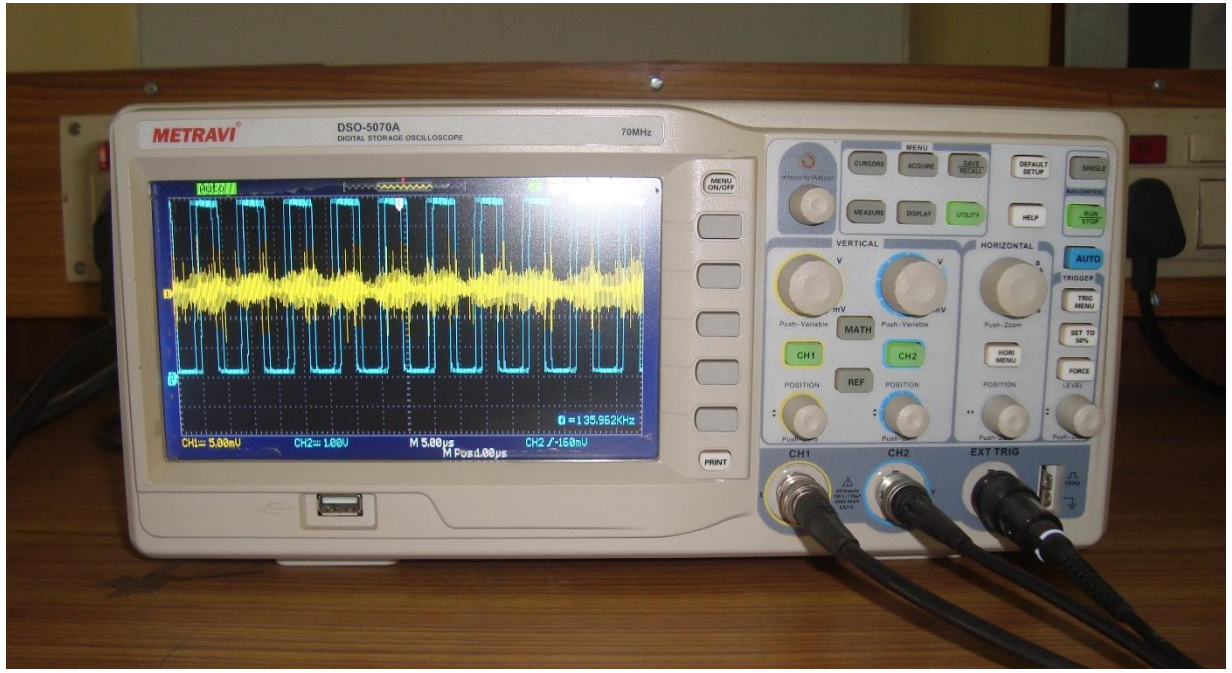
249
ECE
254
249


MICROLAB-IV
FREQUENCY COUNTER
FUNCTION GENERATOR


MICROLAB-II
TRANSFORMER
FUNCTION GENERATOR

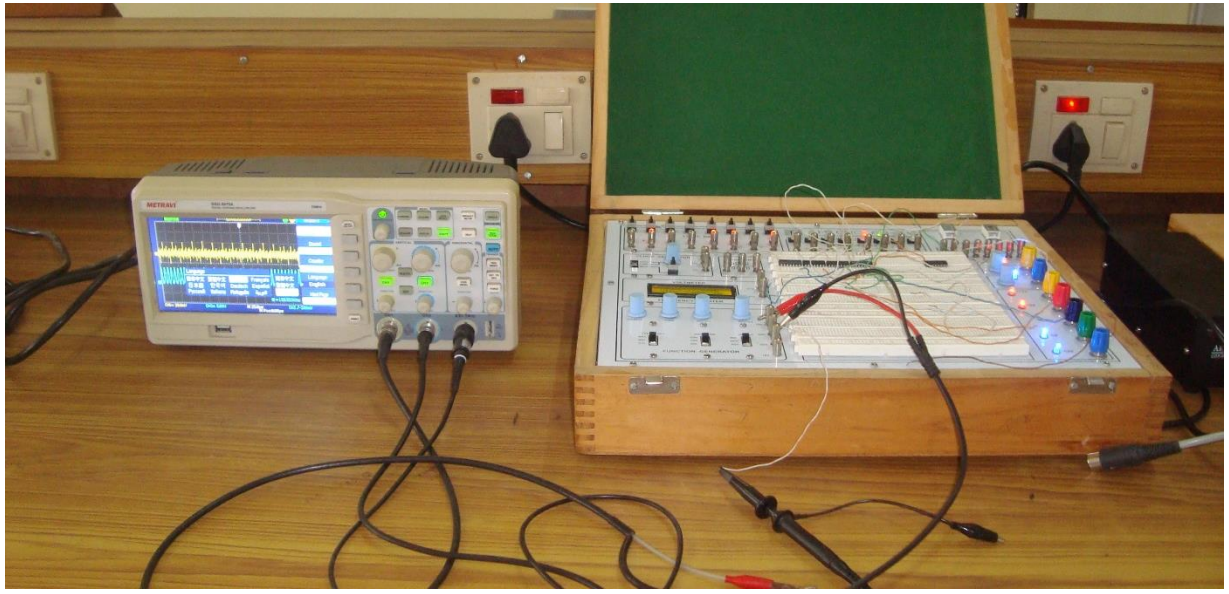
RESISTOR BANK
CAPACITOR BANK
TRANSISTOR BANK
BEL-TAT : TRANSISTOR APPLICATION TRAINER
AKADEMIKA
BEL-TAT
TRANSISTOR APPLICATION TRAINER

MICROLAB-IV


METRAVI
DSO-5070A
DIGITAL STORAGE OSCILLOSCOPE
70MHz
CH1
CH2
EXT TRIG

BEL-TAT : TRANSISTOR APPLICATION TRAINER
AKADEMIKA

AKADEMIKA
FG-002
2MHz
FUNCTION GENERATOR WITH FREQUENCY COUNTER
kHz
POWER
RANGE(Hz)/GATE
FUNCTION
ATT
COUNT
FREQUENCY
DUTY
OFFSET
AMPL
OUTPUT
TTL OUTPUT
EXT.COUNT



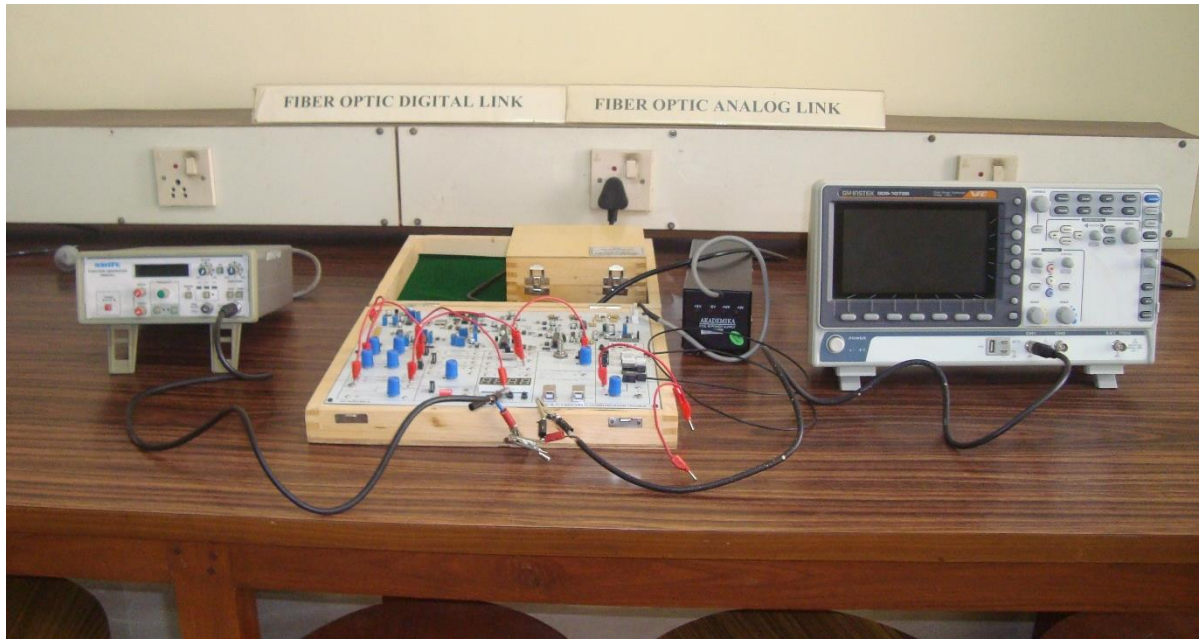
TRANSISTOR POWER SUPPLY 612
VOLTS
10-20
0-10
20-30
CURRENT
30-100
10-30
0,1-0,3
0,3-1,0
mA
A
FINE
FINE
METER
V
A
POWER
OUTPUT
-S
+S

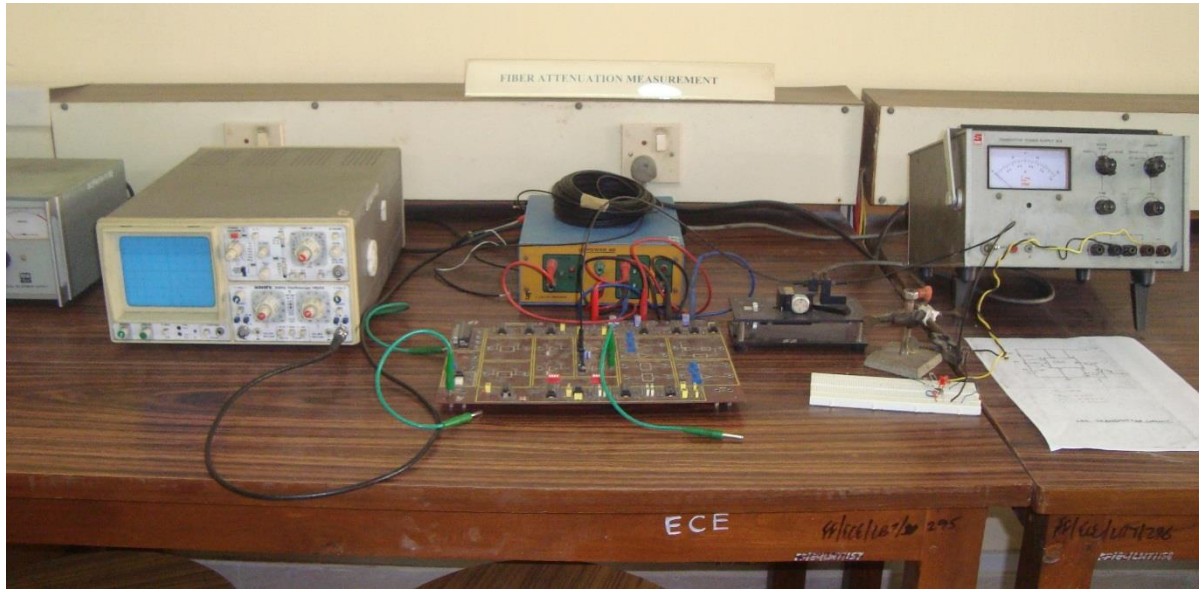
TRANSISTOR POWER SUPPLY 612
VOLTS
10-20
0-10
20-30
CURRENT
30-100
10-30
0,1-0,3
0,3-1,0
mA
A
FINE
FINE
METER
V
A
POWER
OUTPUT
-S
+S

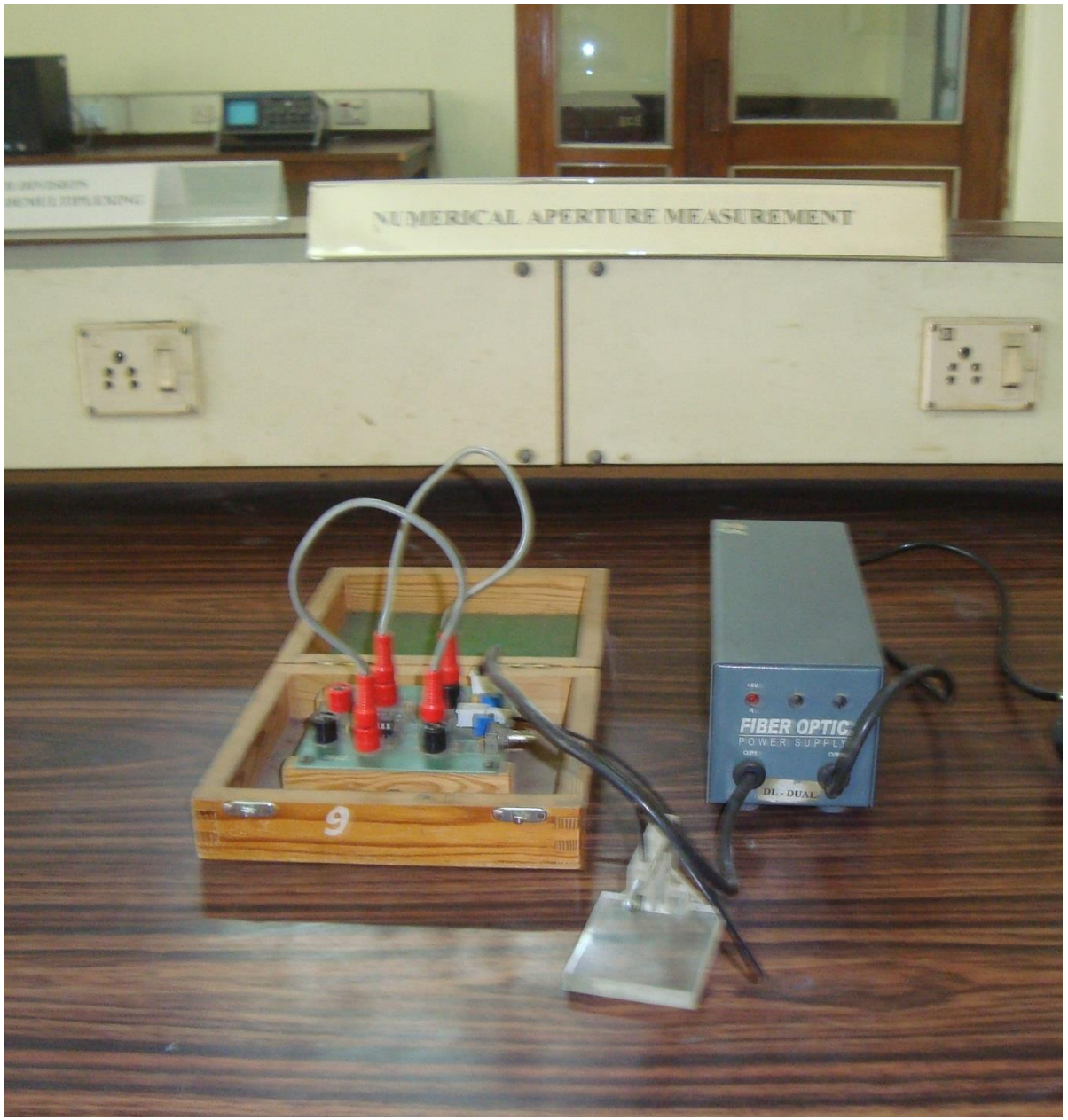
AUTO IC TESTER 902
VOLT
4.75
5.00
5.25
ANALY
COUNT
MLD
SELF TEST
MODE
NORM
DEEP
mA
SEARCH
0
1
2
3
4
TEST ONCE
TEST CONT
DIR
CLEAR
5
6
7
8
9
UNDER TEST

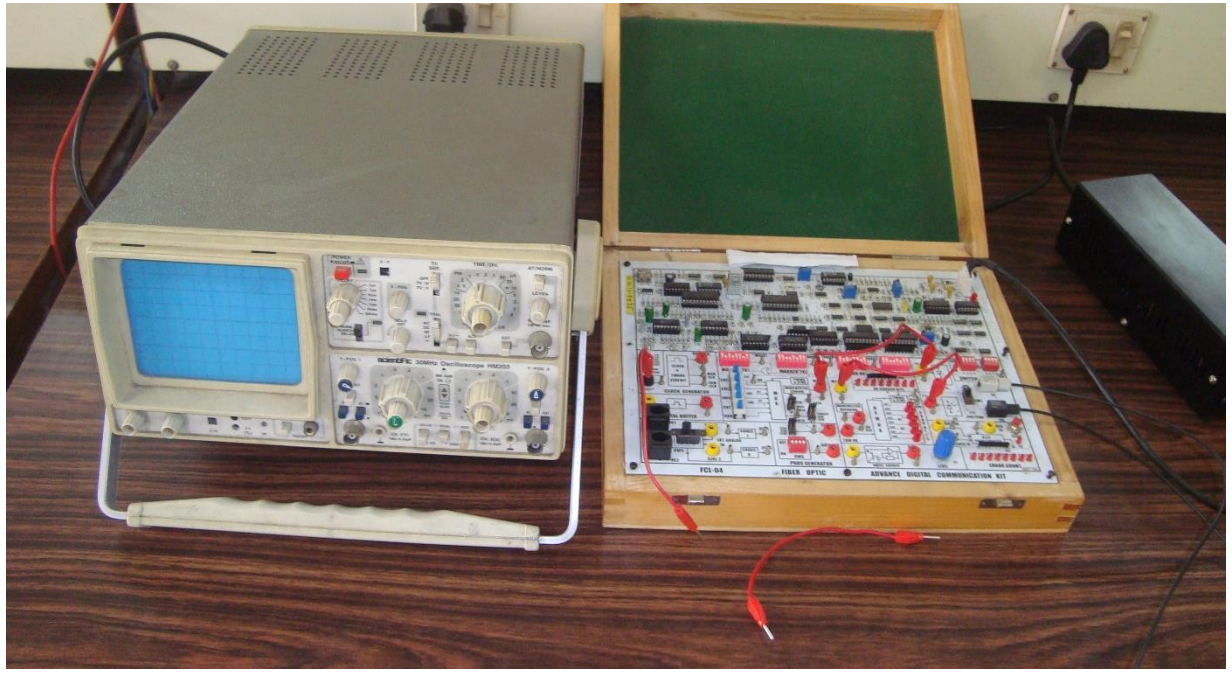
Fiber Communication Lab

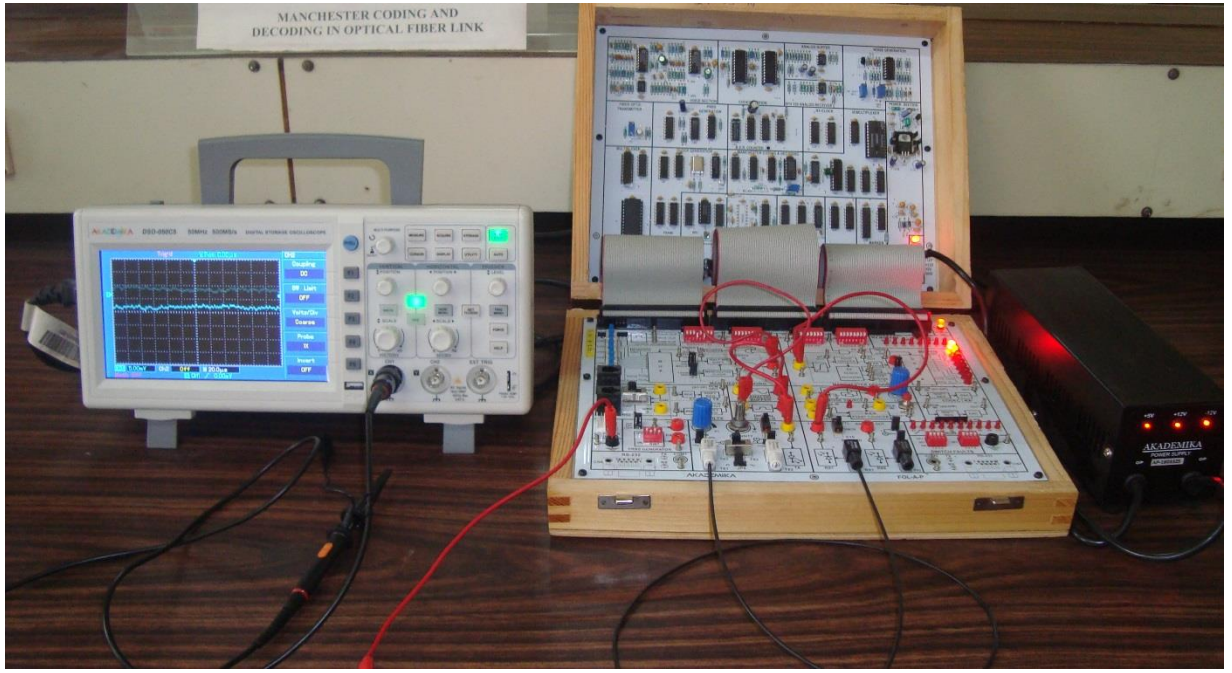
For UG only


FIBER OPTIC DIGITAL LINK
FIBER OPTIC ANALOG LINK

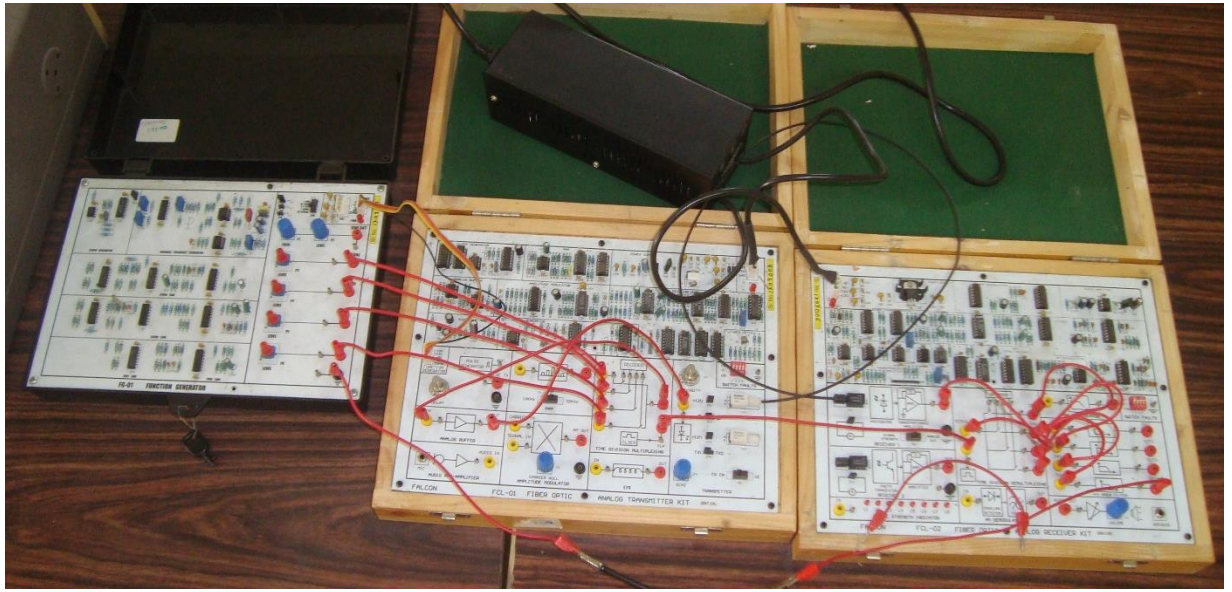

FIBER ATTENUATION MEASUREMENT
ECE

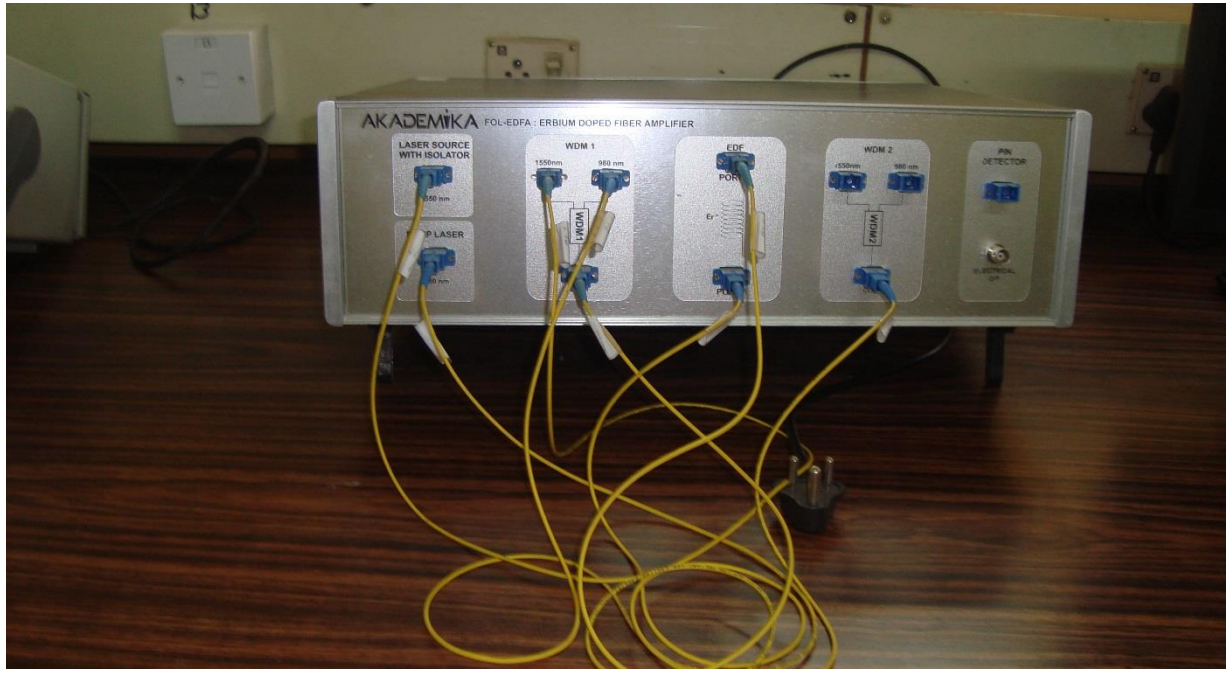

NUMERICAL APERTURE MEASUREMENT
9
FIBER OPTIC
POWER SUPPLY
DL - DUAL

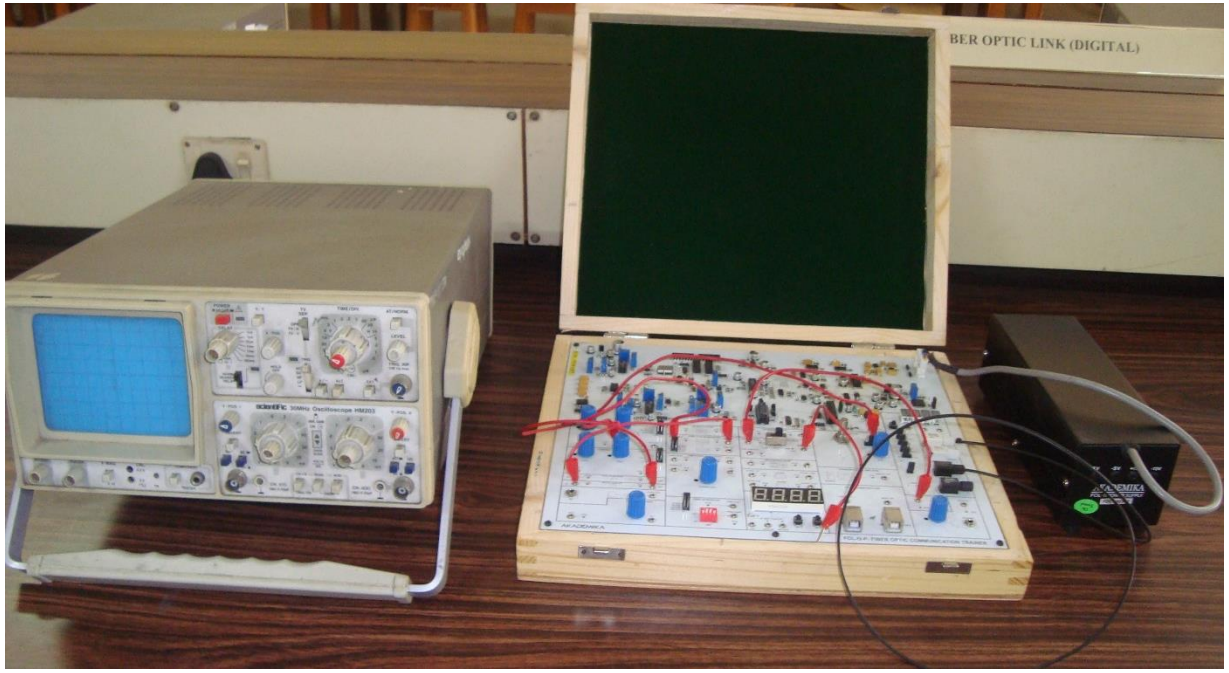


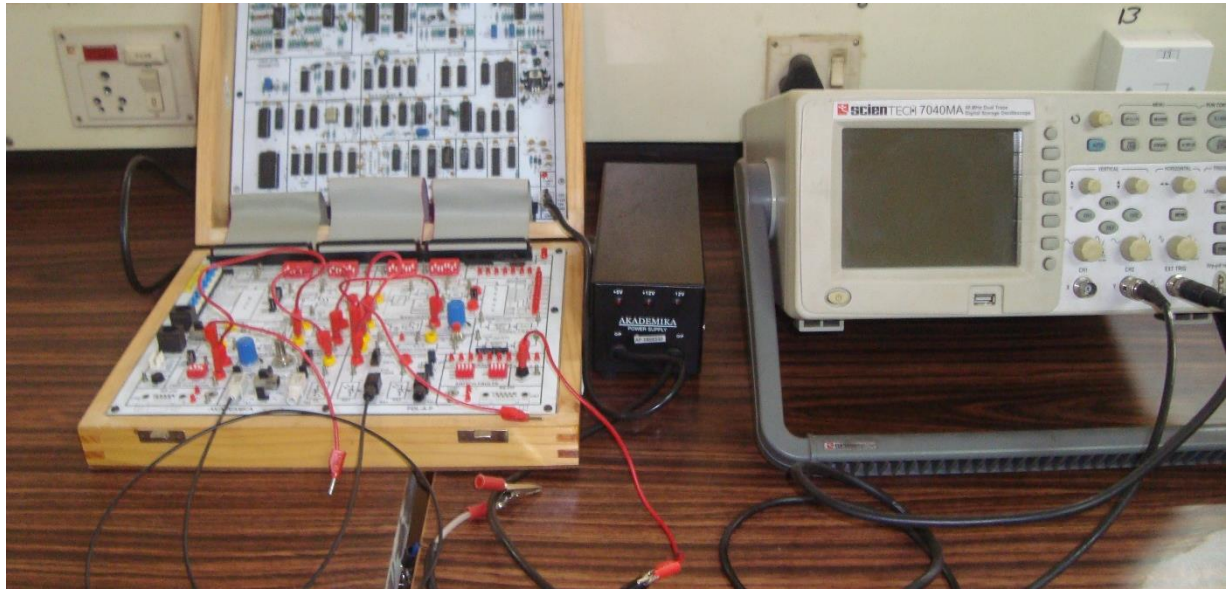

MANCHESTER CODING AND
DECODING IN OPTICAL FIBER LINK

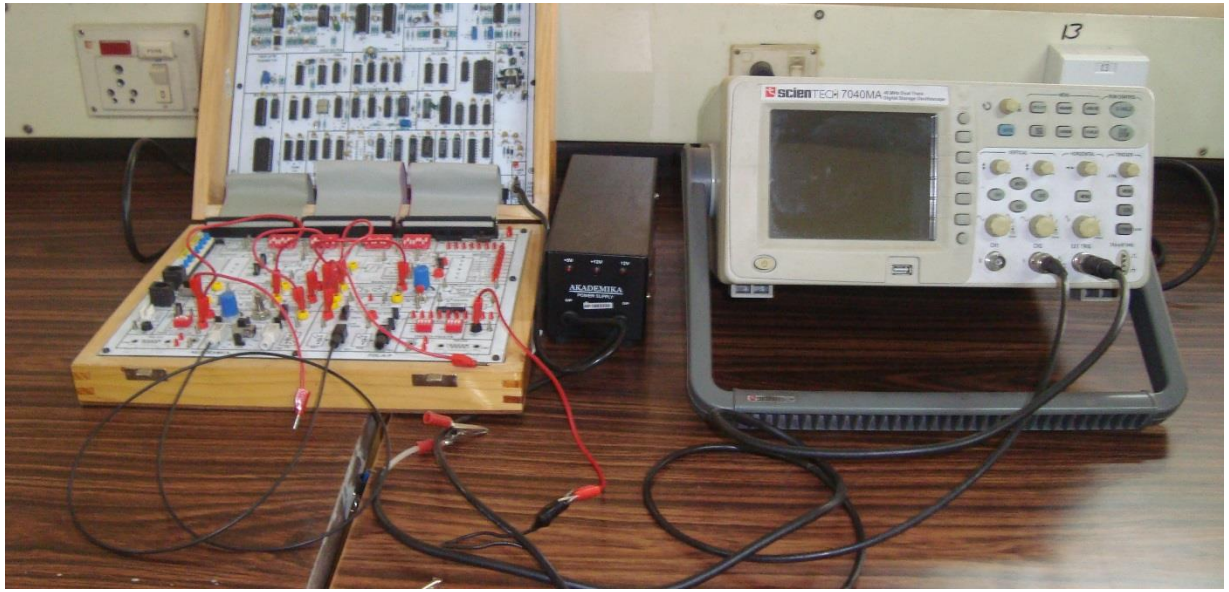
TDM FIBER OPTIC LINK (ANALOG)
WAVELENGTH DIVISION
MULTIPLEXING AND DEMULTIPLEXING
EFE




AKADEMIKA
FOL-EDFA : ERBIUM DOPED FIBER AMPLIFIER
LASER SOURCE WITH ISOLATOR
WDM 1
EDF
WDM 2
PIN DETECTOR

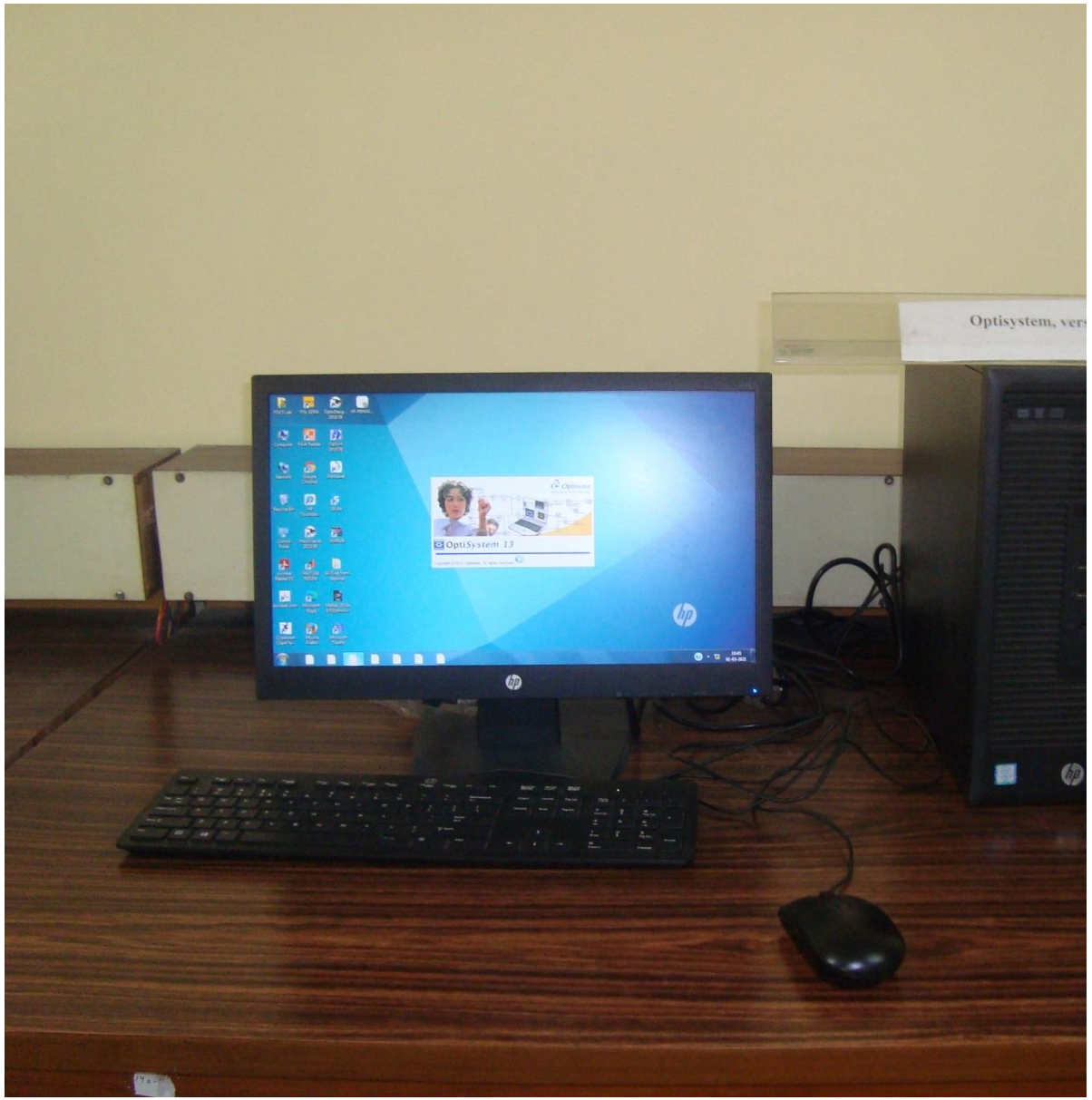

BER OPTIC LINK (DIGITAL)


scienTECH 7040MA
AKADEMIKA


scienTECH 7040MA
AKADEMIKA

FIBER OPTIC ANALOG LINK
GW INSTEK GDS-1072B
Digital Storage Oscilloscope
70 MHz 1 GS/s
VPO
VARIABLE
Measure
Cursor
APP
Acquire
Display
Help
Save/Recall
Utility
Autoset
Run/Stop
Single
Default
HORIZONTAL
POSITION
SCALE
Select
Search
Set/Clear
Zoom
VERTICAL
TRIGGER
MATH
REF
BUS
CH1
CH2
Menu
50 %
Force-Trig
POWER
EXT TRIG

FIBER OPTIC ANALOG LINK
GW INSTEK GDS-1072B
VARIABLE
Measure
Cursor
APP
Acquire
Display
Help
Save/Recall
Utility
HORIZONTAL
Search
Set/Clear
Zoom
SCALE
VERTICAL
POSITION
MATH
REF
BUS
CH1
CH2
POWER
2V
CH1
CH2
EXT TRIG


Optisystem, vers
OptiSystem 13

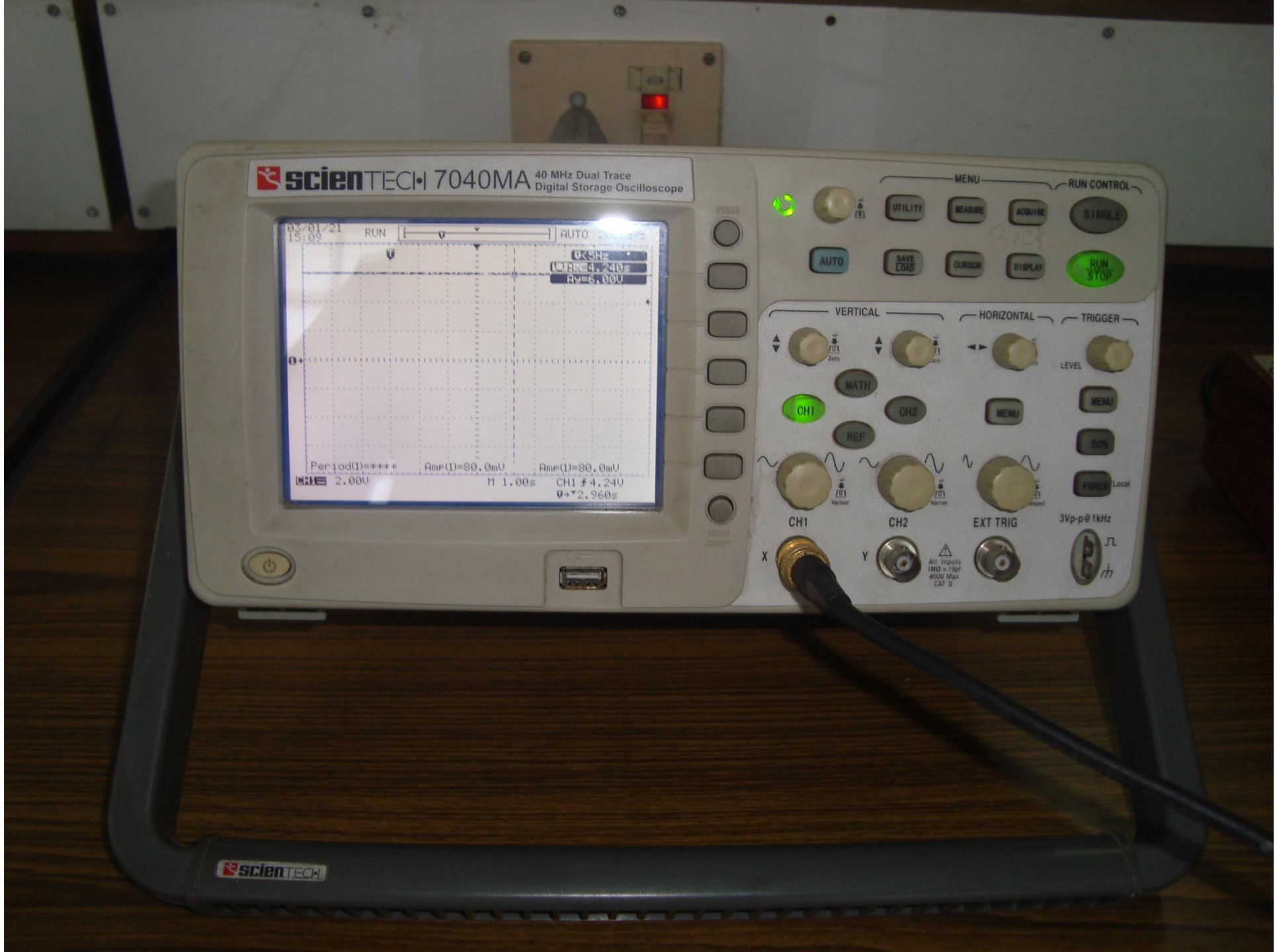
Fiber Research Communication Lab

For PhD and PG only

MELLES GRIOT

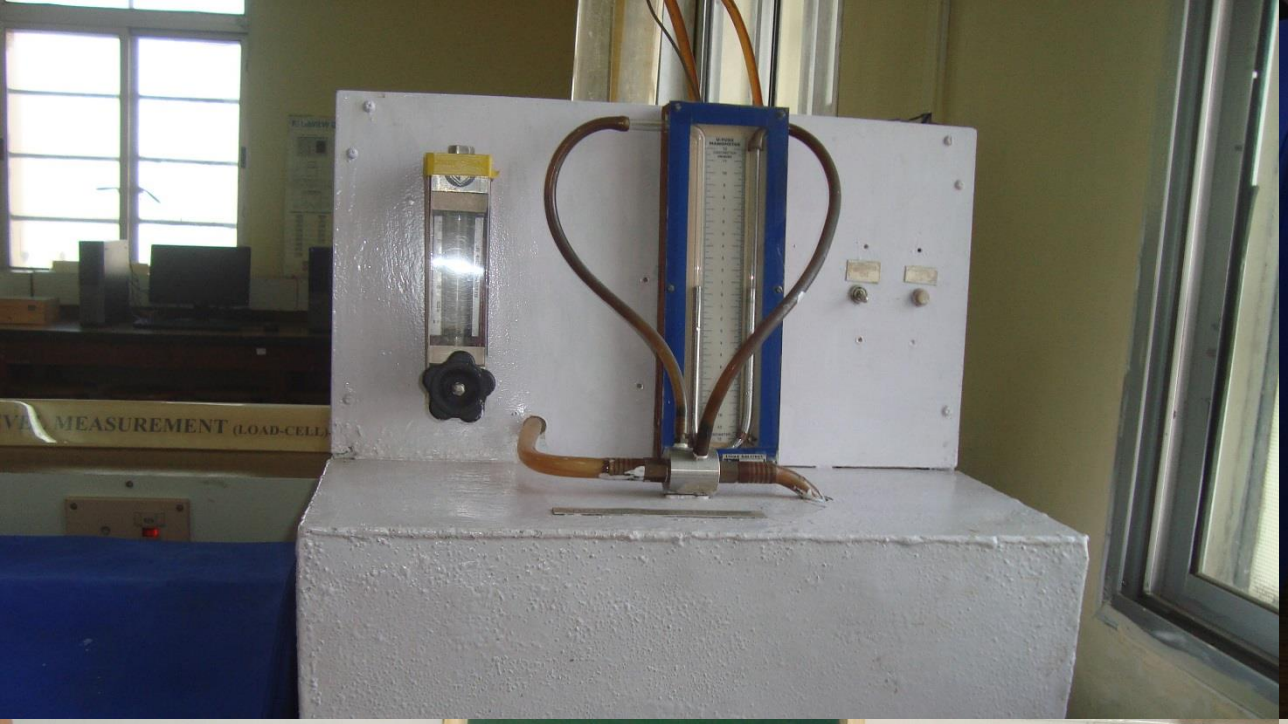
Vibration Isolation Table
MELLES GRIOT
MELLES GRIOT

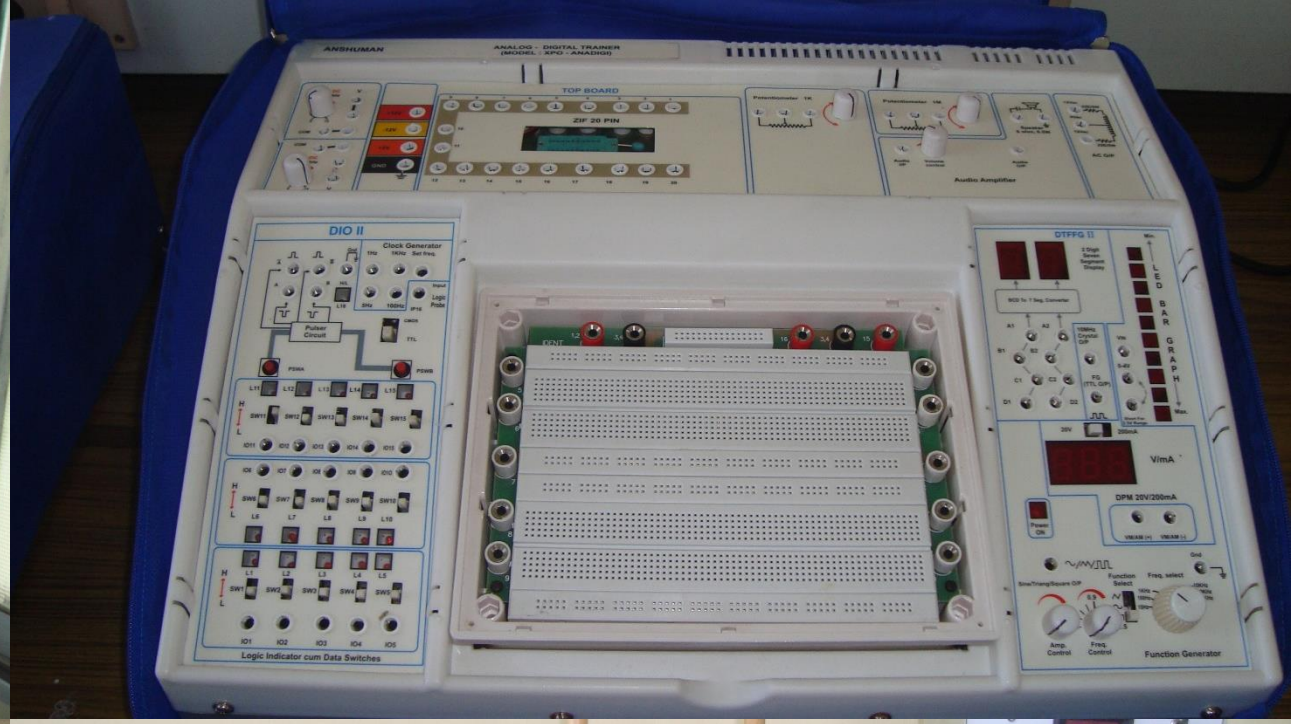
FBG-Interrogator
(Funded by TEQIP-II)
MB-13437
SMARTSCAN
DYNAMIC FBG INTERROGATOR

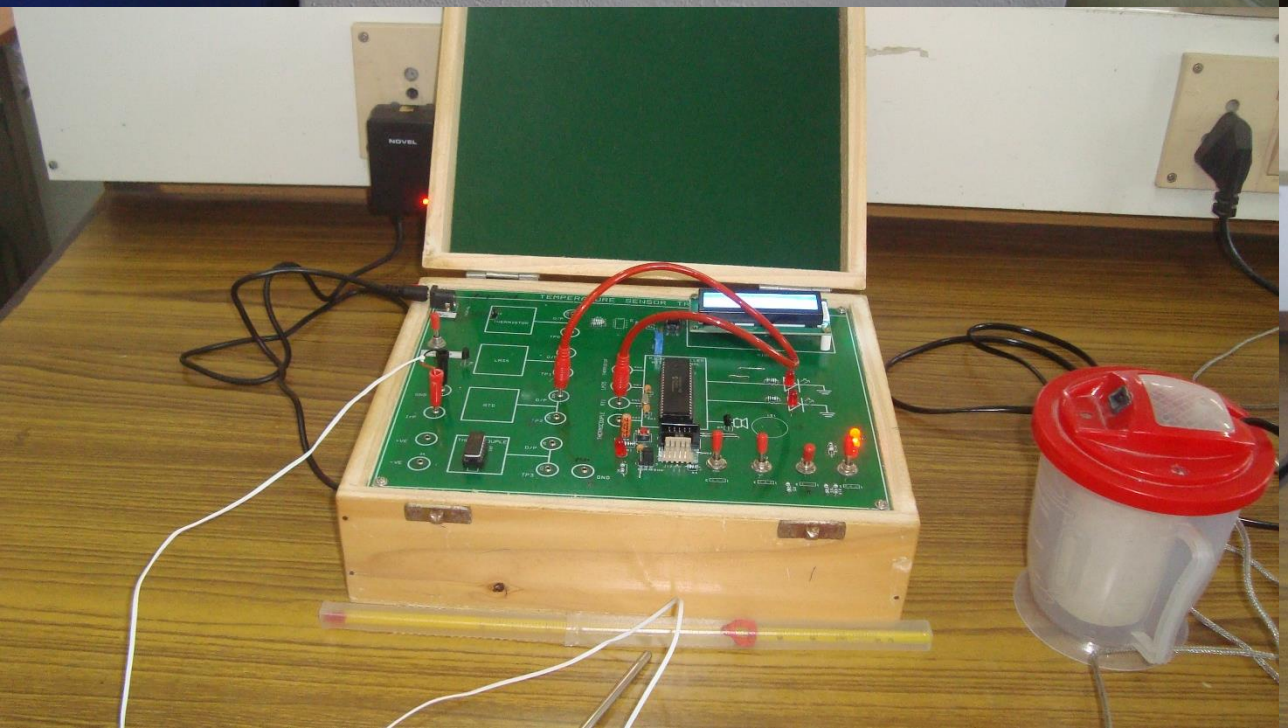

scienTECH 7040MA
40 MHz Dual Trace
Digital Storage Oscilloscope
RUN
AUTO
MENU
RUN CONTROL
UTILITY
MEASURE
ACQUIRE
SINGLE
AUTO
SAVE LOAD
CURSOR
DISPLAY
RUN STOP
VERTICAL
HORIZONTAL
TRIGGER
LEVEL
MATH
CH1
CH2
REF
MENU
50%
FORCE
Local
CH1
CH2
EXT TRIG
3Vp-p@1kHz
X
Y
All Inputs
1MΩ ≈ 19pF
400V Max
CAT II
scienTECH

Instrumentation Lab

For UG students only


MEASUREMENT (LOAD-CELL


ANSHUMAN
ANALOG - DIGITAL TRAINER
TOP BOARD
ZIF 20 PIN
DIO II
Clock Generator
Logic Indicator cum Data Switches
DTFFG II
LED BAR GRAPH
DPM 20V/200mA
Function Generator

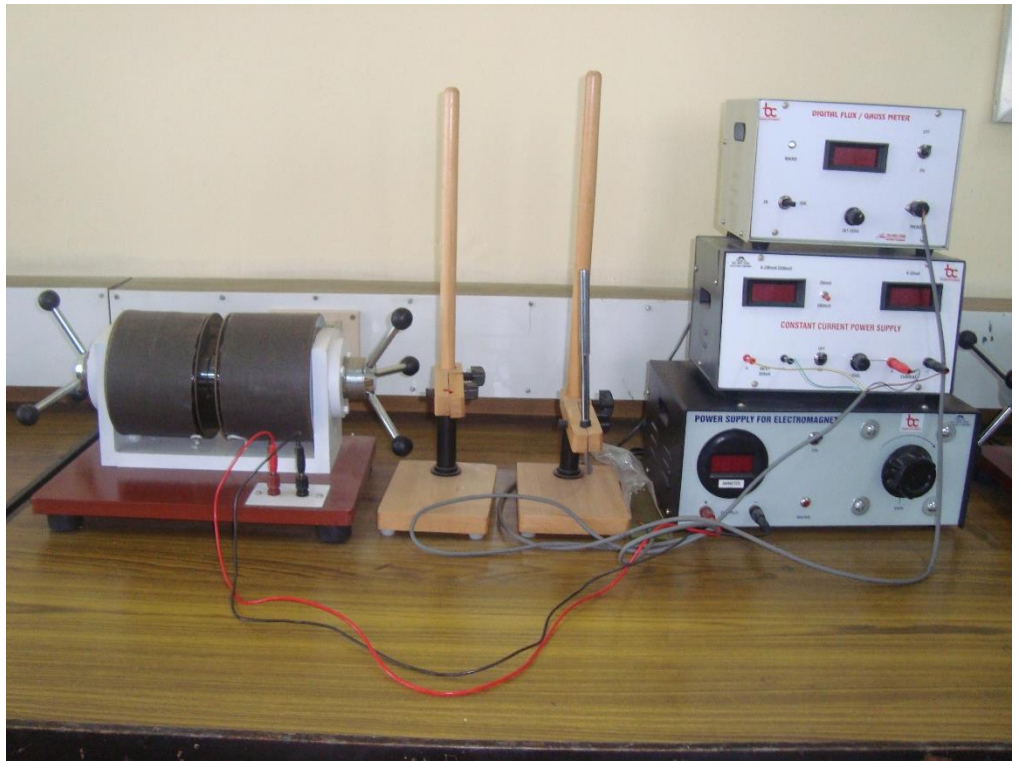

NOVEL

CONSTANT CURRENT POWER SUPPLY
POWER SUPPLY FOR ELECTROMAGNE

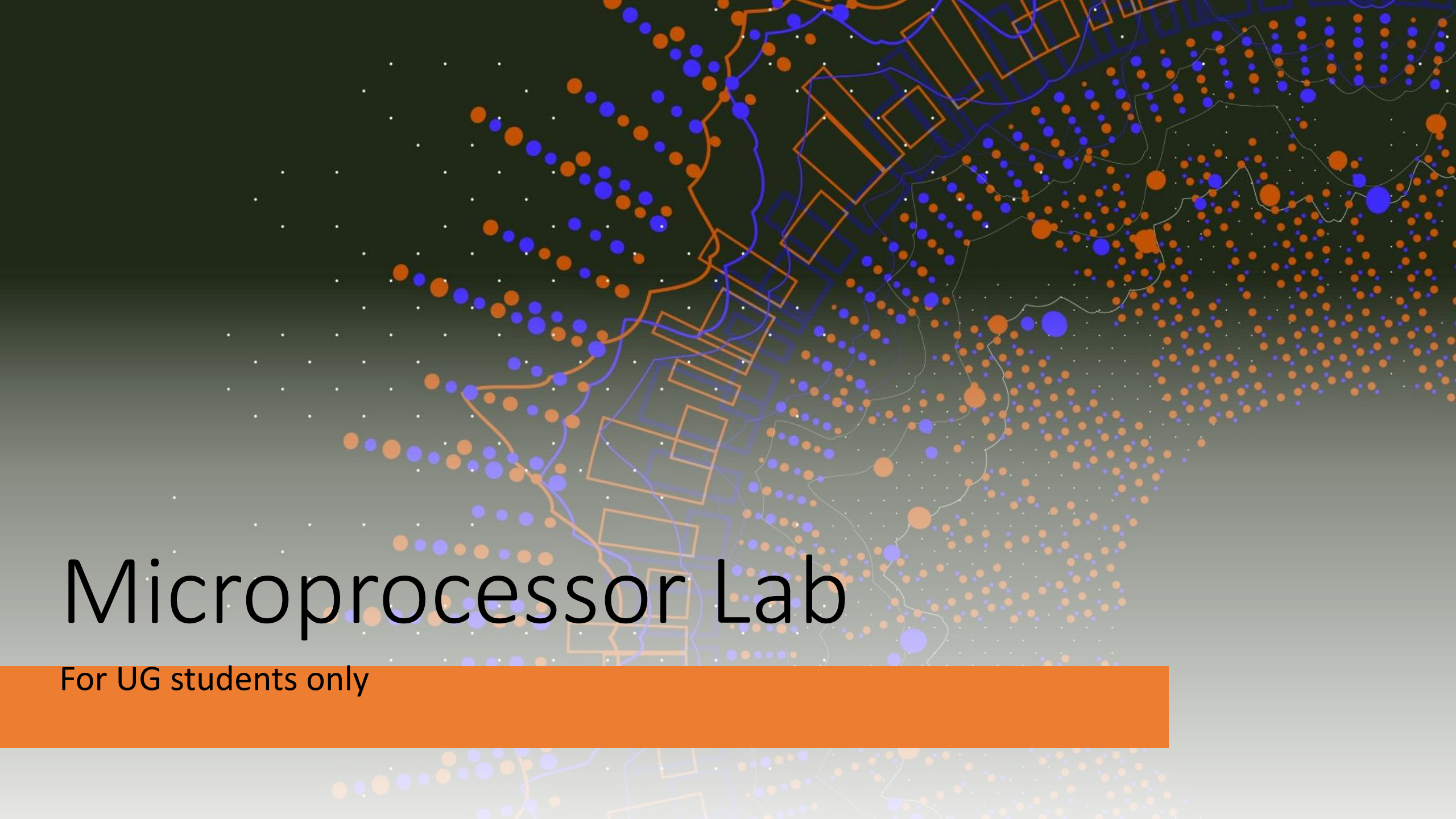
PV CELL CHARACTERIZATION KIT
VOLTAGE
CURRENT
PV CELL CHARACTERIZATION KIT
VOLTAGE
CURRENT

Kg/cm²

DIO II
Logic Indicator cum Data Switches
Function Generator


DIGITAL FLUX / GAUSS METER
CONSTANT CURRENT POWER SUPPLY
POWER SUPPLY FOR ELECTROMAGNET

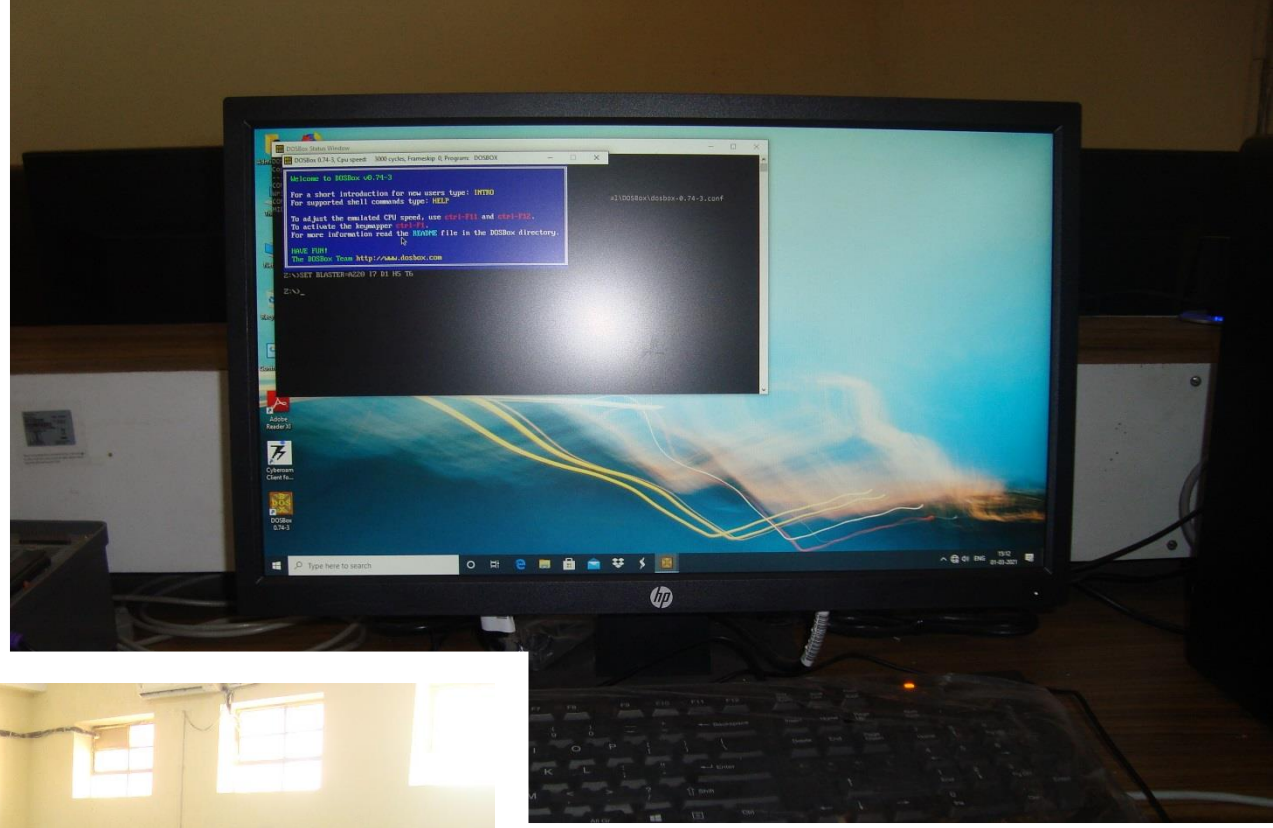
INDOSAM
FOUR PROBE SET-UP
HEATER
ON



Microprocessor Lab

For UG students only

Kitek
8051 CPU
M51-02 8051 MICROCONTROLLE


Welcome to DOSBox v0.74-3
For a short introduction for new users type: INTRO
For supported shell commands type: HELP
HAVE FUN!
The DOSBox Team http://www.dosbox.com

Microwave Lab

For UG and PG students

FREQUENCY MEASUREMENT (LINE PARAMETERS)

MICROWAVE
LAB.

COUPLING COEFFICIENT (H-PLANE TEE)

COUPLING COEFFICIENT (H-PLANE TEE)

COUPLING COEFFICIENT (H-PLANE TEE)

SQUARE LAW CHARACTERISTICS

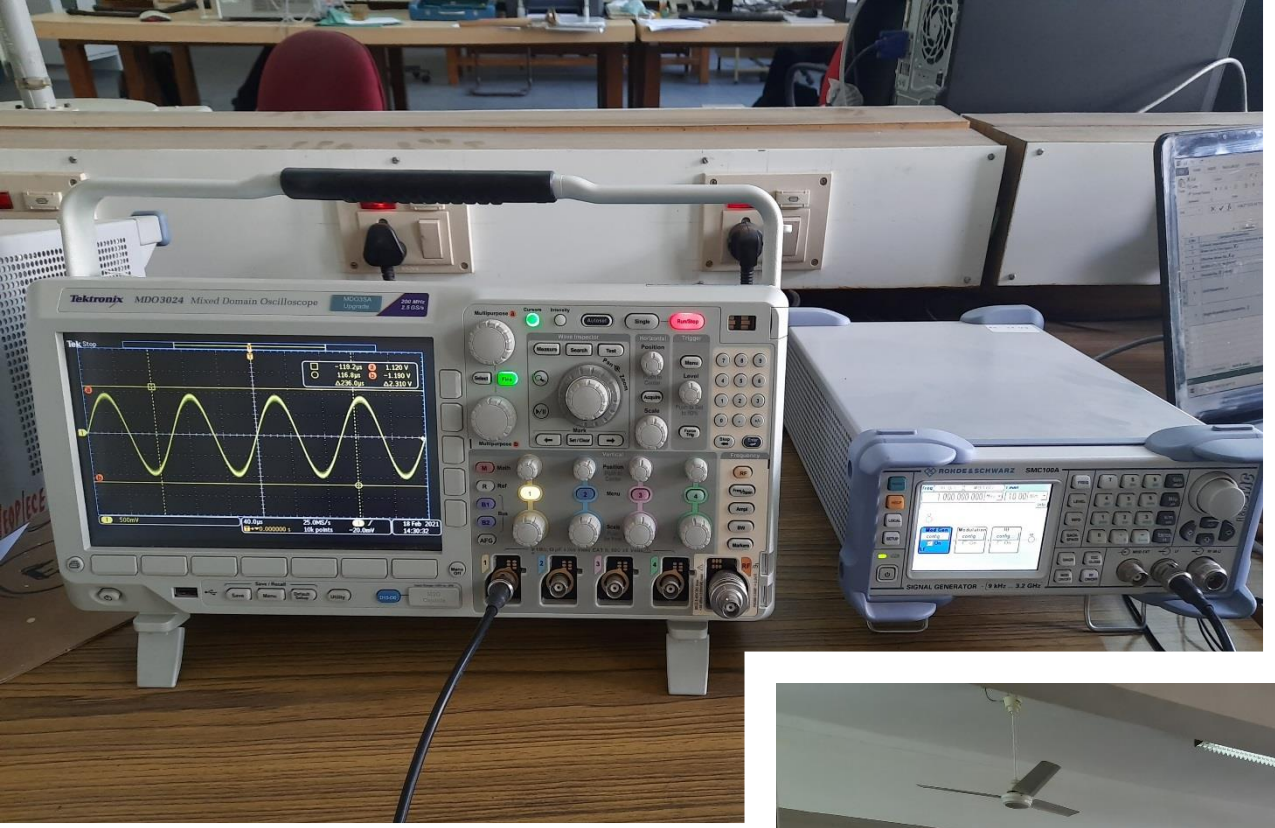
WAVEGUIDE PARAMETERS MEASUREMENT

POWER GAIN MEASUREMENT (μSTRIP)

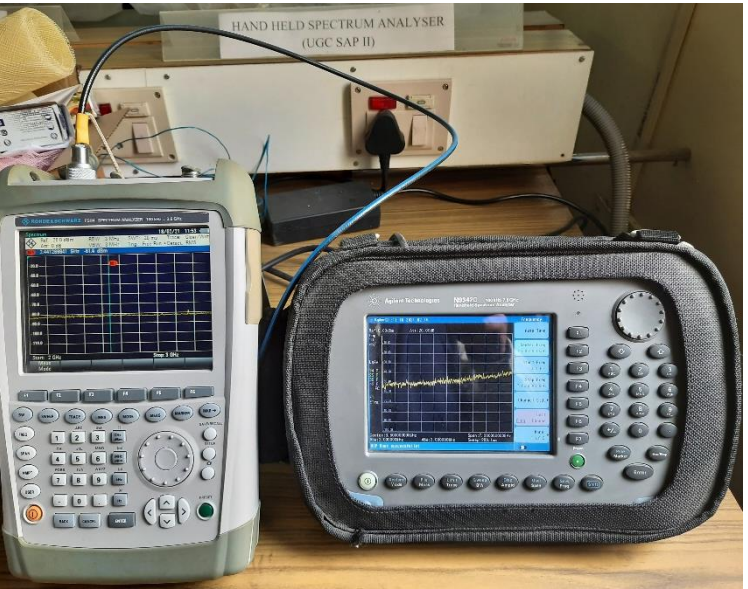
COUPLING COEFFICIENT (MAGIC TEE)

Antenna Lab

For PG and PhD studebts


Tektronix MDO3024 Mixed Domain Oscilloscope
ROHDE&SCHWARZ SMC100A
SIGNAL GENERATOR

RX7
RIGHT SIDE PANEL RX
RX8
RX1
RX2
A PAIR OF ANECHOIC CHAMBER


HAND HELD SPECTRUM ANALYSER
(UGC SAP II)

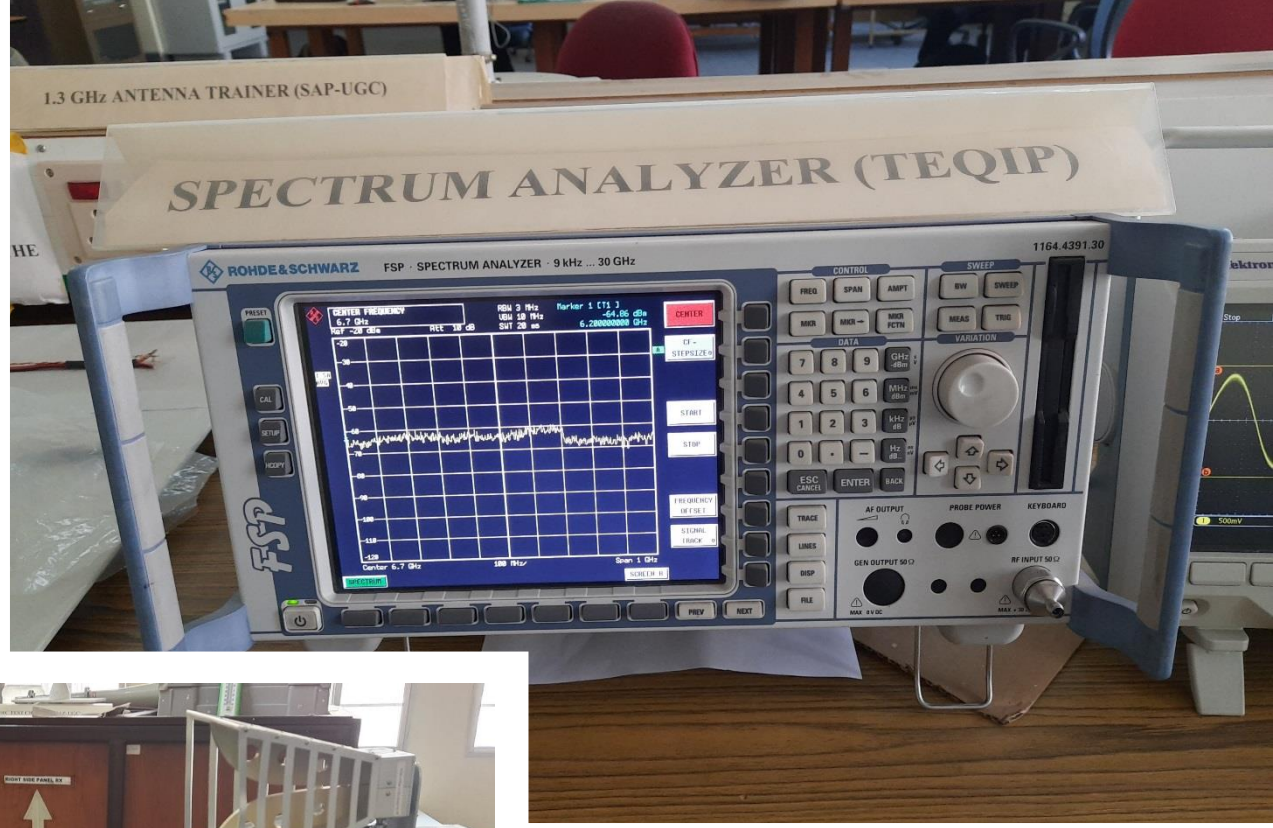
ANTENNA LAB.
ANTENNA AND COMPUTATIONAL ELECTROMAGNETICS LAB
ANTENNA LAB

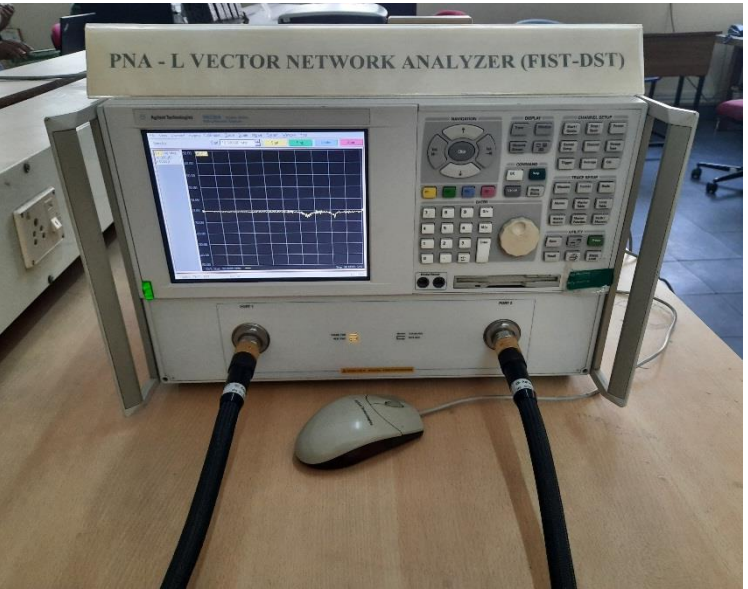
IE3D SOFTWARE

HFSS SOFTWARE (TEQIP III)

LISN (UGC SAP II)
ROHDE&SCHWARZ
ENV216 TWO-LINE V-NETWORK

FOR STUDY THE DIFFERENT CROSSTALK IN THE CABLE
SIGNAL GENERATOR (TEQIP)
ROHDE&SCHWARZ
SIGNAL GENERATOR
1GHz..20GHz
SMR 20
1104.0002.20
6.600 000 000 0 GHz
25.0 dBm


1.3 GHz ANTENNA TRAINER (SAP-UGC)
SPECTRUM ANALYZER (TEQIP)
ROHDE&SCHWARZ
FSP · SPECTRUM ANALYZER · 9 kHz ... 30 GHz
1164.4391.30
FSP

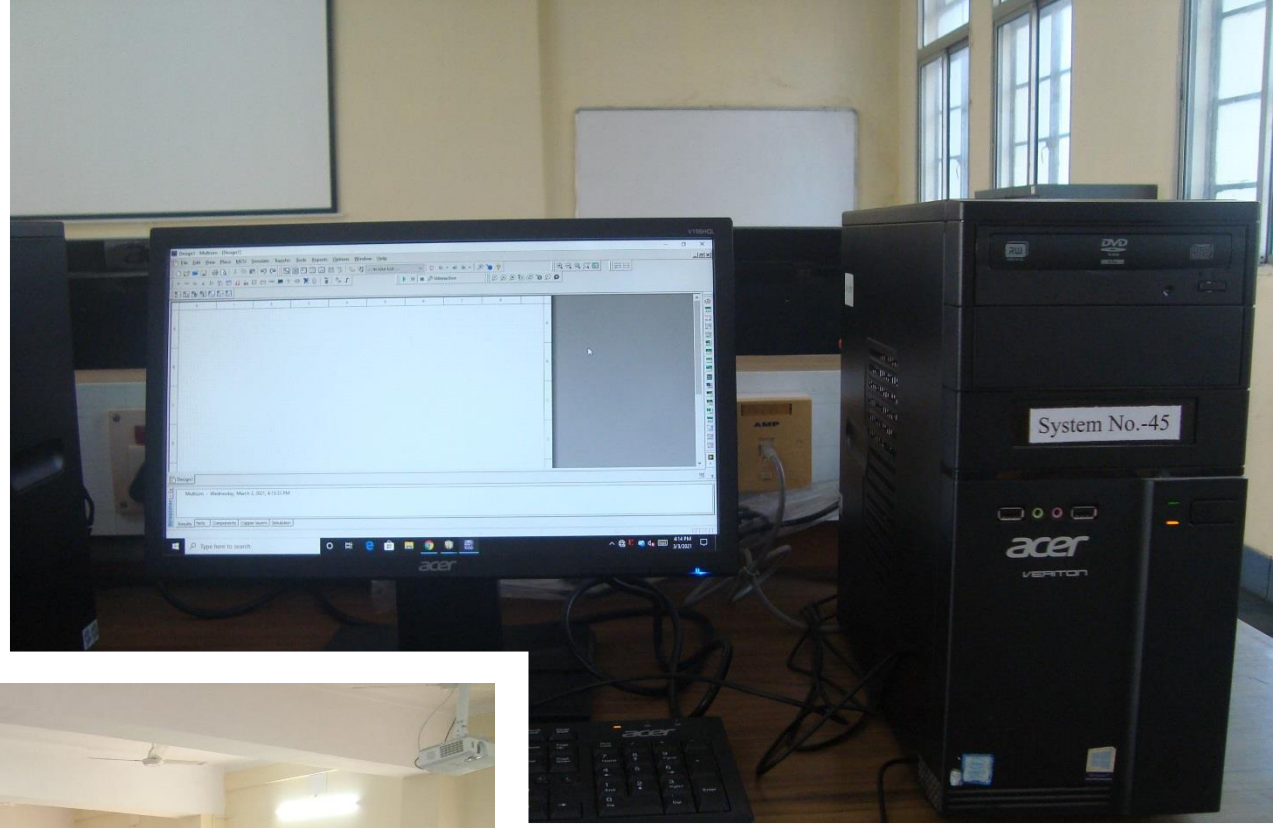

PNA - L VECTOR NETWORK ANALYZER (FIST-DST)

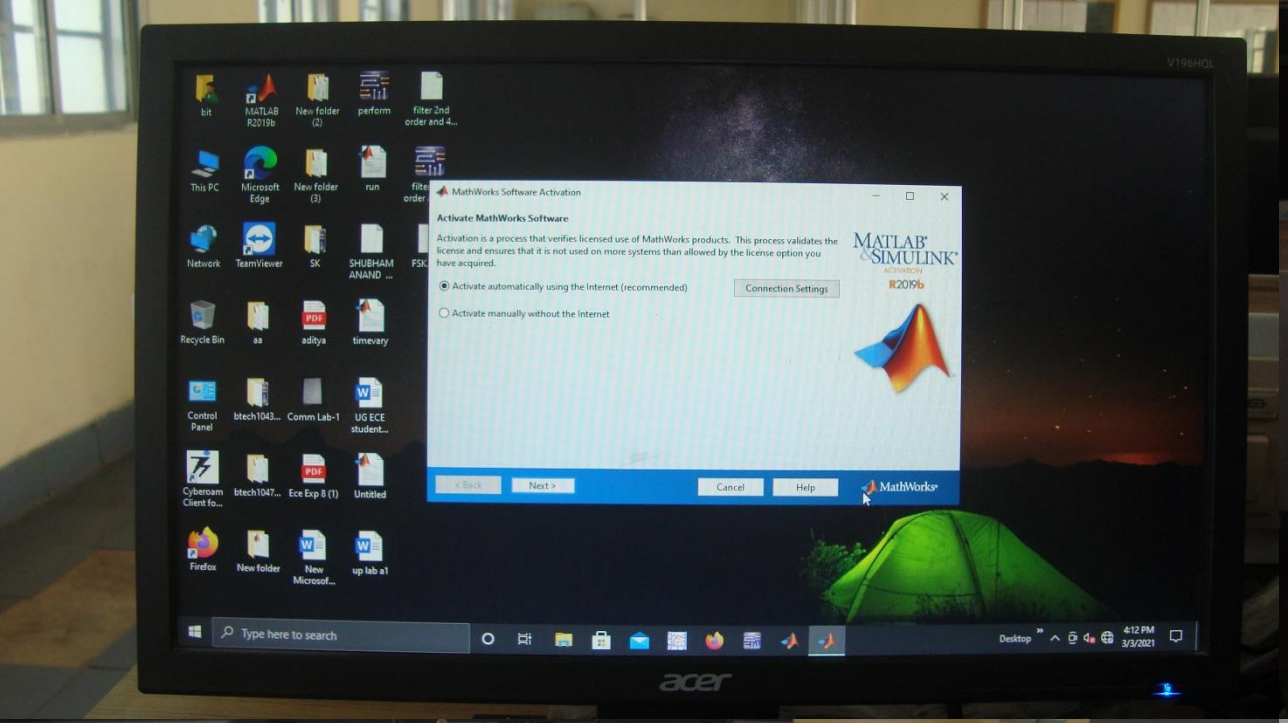
A PAIR OF WIDEBAND HORN ANTENNA

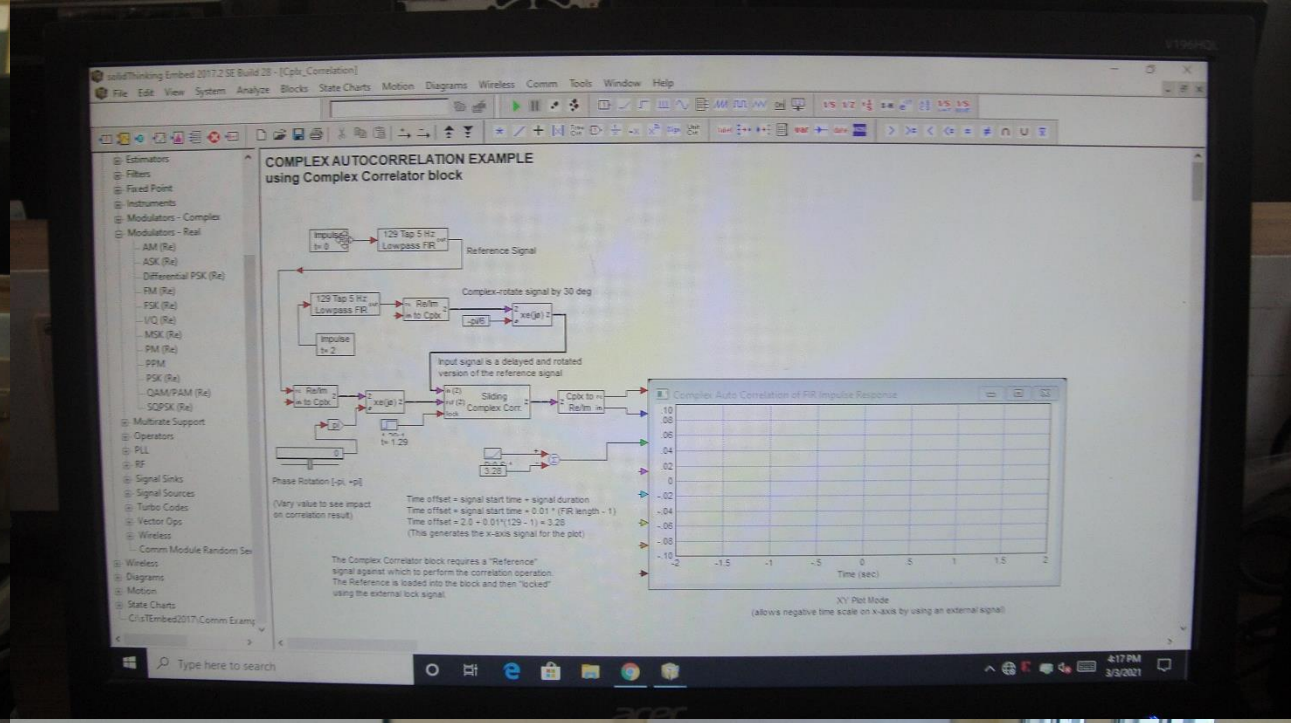
ADVANCED MICROSTRIP TRAINER KIT (SAP-UGC)

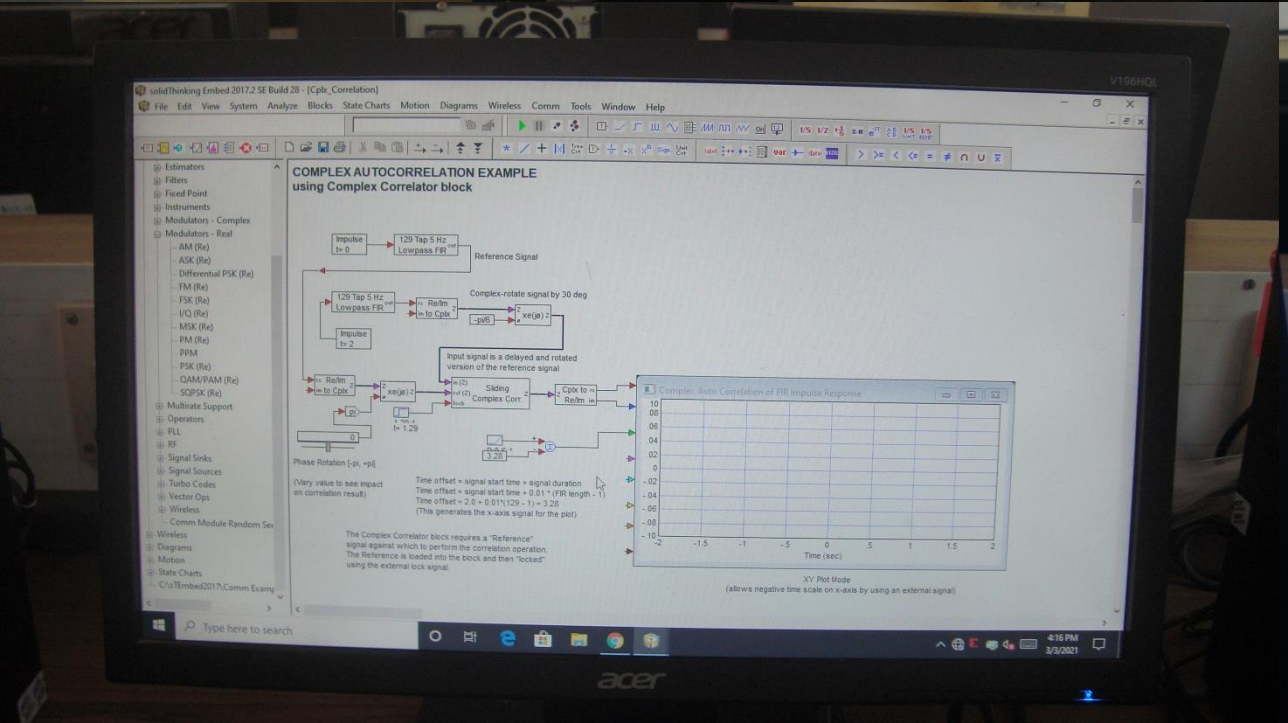
Circuit Simulation Lab

For UG students only


System No.-45
acer
VERITON


MathWorks Software Activation
Activate MathWorks Software
Activation is a process that verifies licensed use of MathWorks products. This process validates the license and ensures that it is not used on more systems than allowed by the license option you have acquired.
Activate automatically using the Internet (recommended)
Connection Settings
Activate manually without the Internet
MATLAB & SIMULINK
ACTIVATION
R2019b
< Back
Next >
Cancel
Help
MathWorks
Type here to search
4:12 PM
3/3/2021


COMPLEX AUTOCORRELATION EXAMPLE
using Complex Correlator block
Reference Signal
Complex-rotate signal by 30 deg
Input signal is a delayed and rotated version of the reference signal
Phase Rotation [-pi, +pi]
(Vary value to see impact on correlation result)
Time offset = signal start time + signal duration
Time offset = signal start time + 0.01 * (FIR length - 1)
Time offset = 2.0 + 0.01*(129 - 1) = 3.28
(This generates the x-axis signal for the plot)
The Complex Correlator block requires a "Reference" signal against which to perform the correlation operation. The Reference is loaded into the block and then "locked" using the external lock signal.
Complex Auto Correlation of FIR Impulse Response
Time (sec)
XY Plot Mode
(allows negative time scale on x-axis by using an external signal)
Type here to search
4:17 PM
3/3/2021


COMPLEX AUTOCORRELATION EXAMPLE
using Complex Correlator block
Reference Signal
Complex-rotate signal by 30 deg
Input signal is a delayed and rotated version of the reference signal
Phase Rotation [-pi, +pi]
(Vary value to see impact on correlation result)
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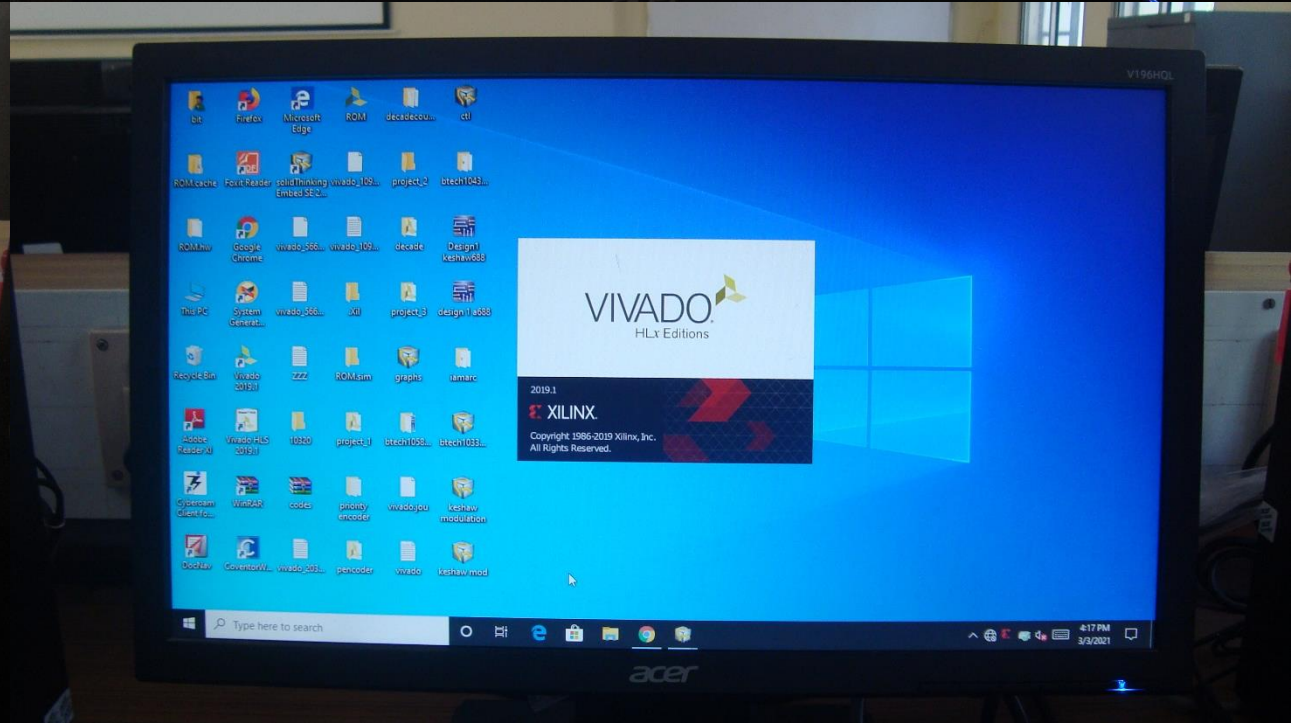
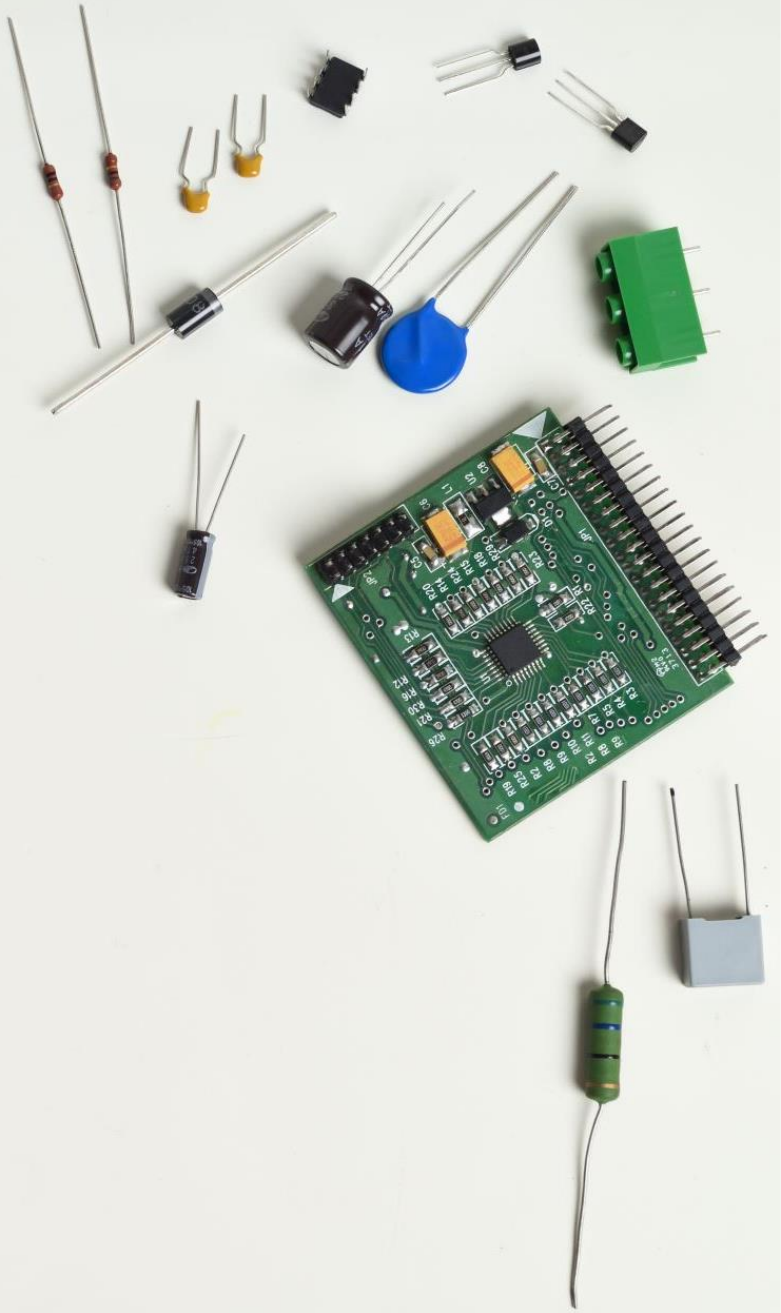
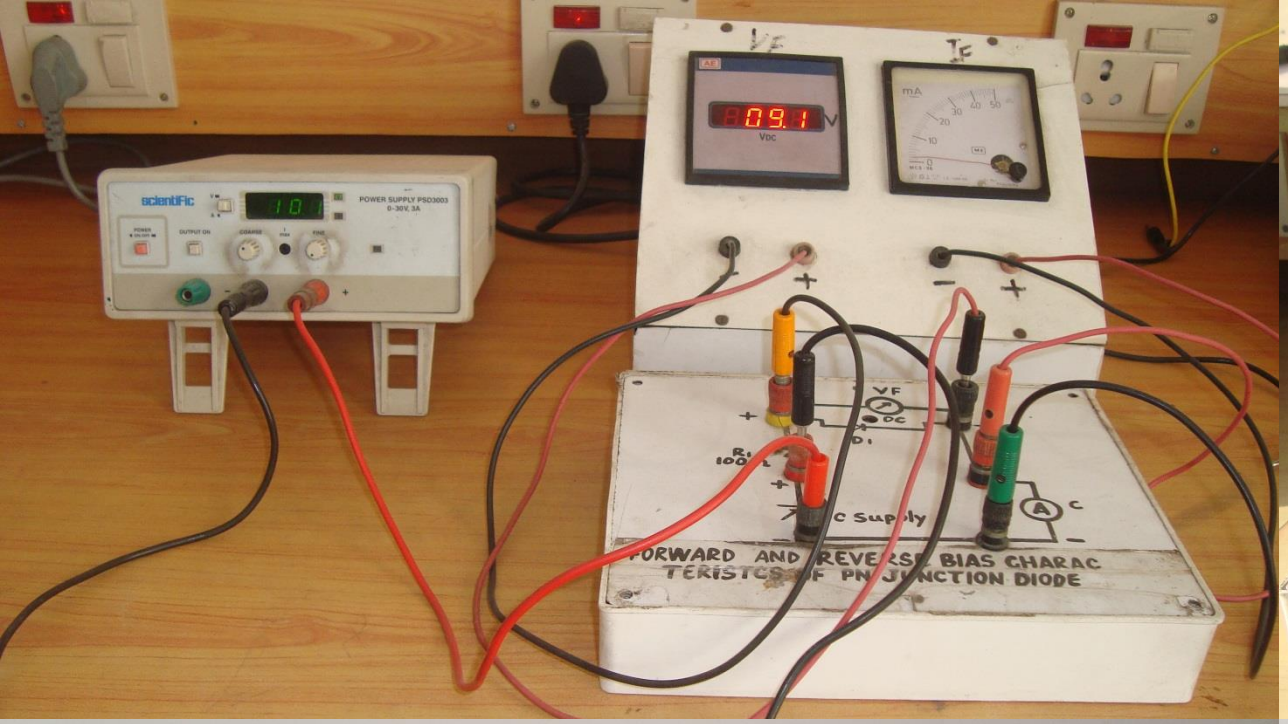
(This generates the x-axis signal for the plot)
The Complex Correlator block requires a "Reference" signal against which to perform the correlation operation. The Reference is loaded into the block and then "locked" using the external lock signal.
Complex Auto Correlation of FIR Impulse Response
Time (sec)
XY Plot Mode
(allows negative time scale on x-axis by using an external signal)
Type here to search
4:16 PM
3/3/2021

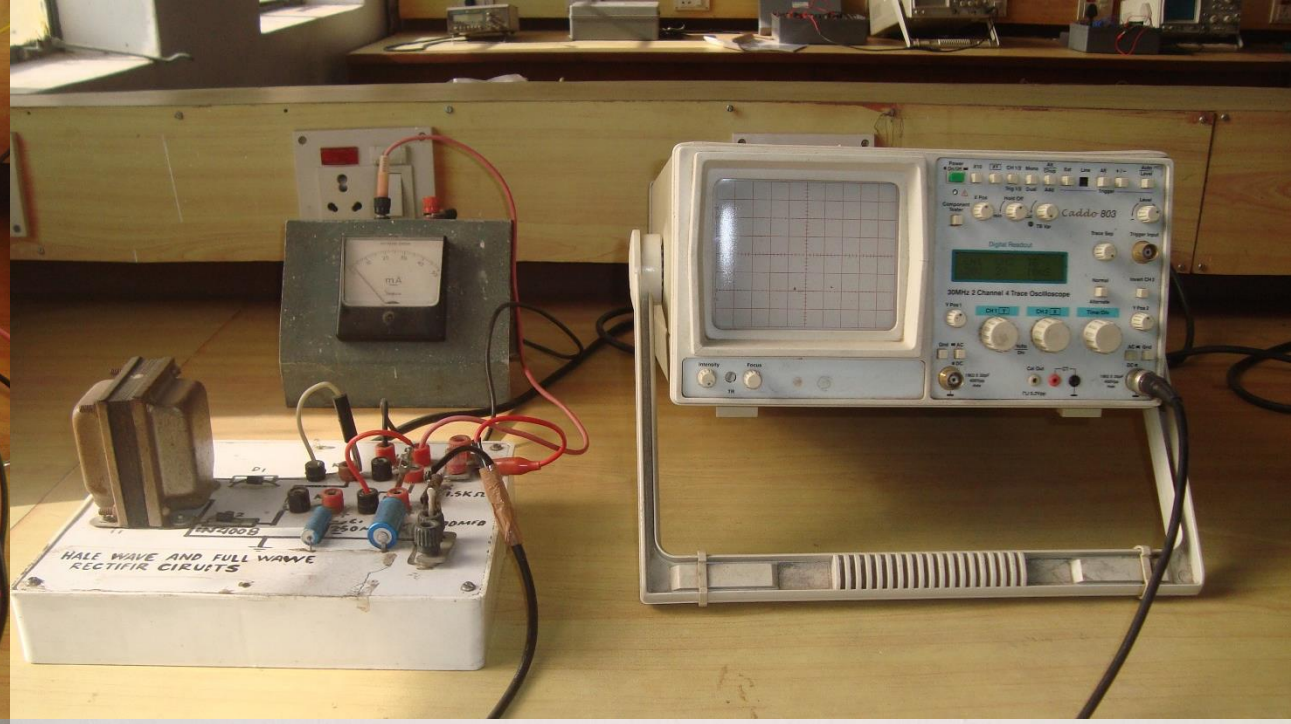

VIVADO
HLx Editions
2019.1
XILINX
Copyright 1986-2019 Xilinx, Inc.
All Rights Reserved.
Type here to search
4:17 PM
3/3/2021

Electronics and Communication Lab

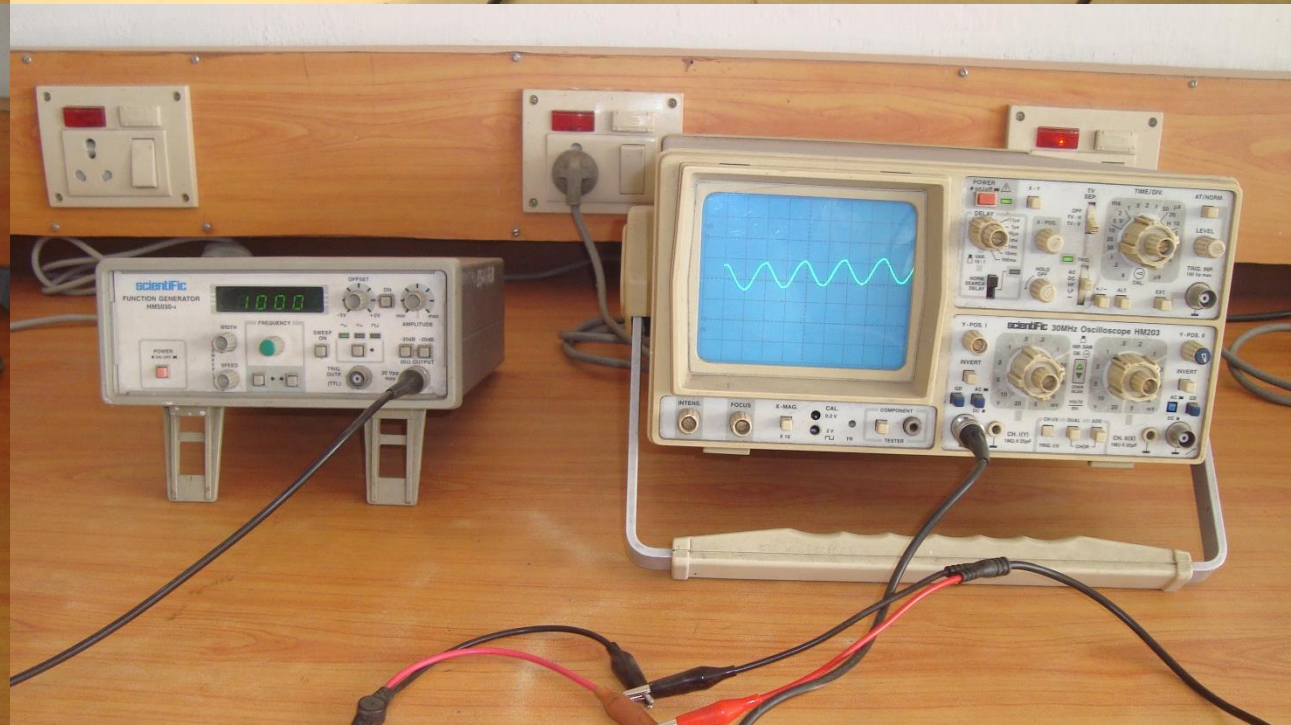
For UG students only

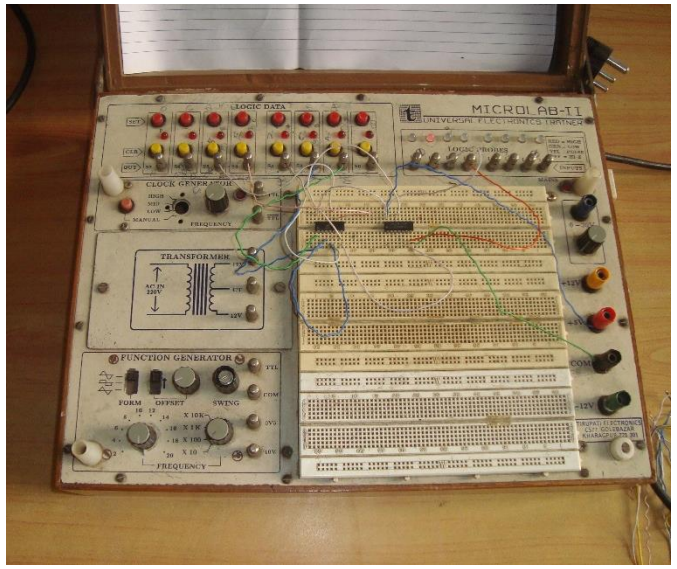


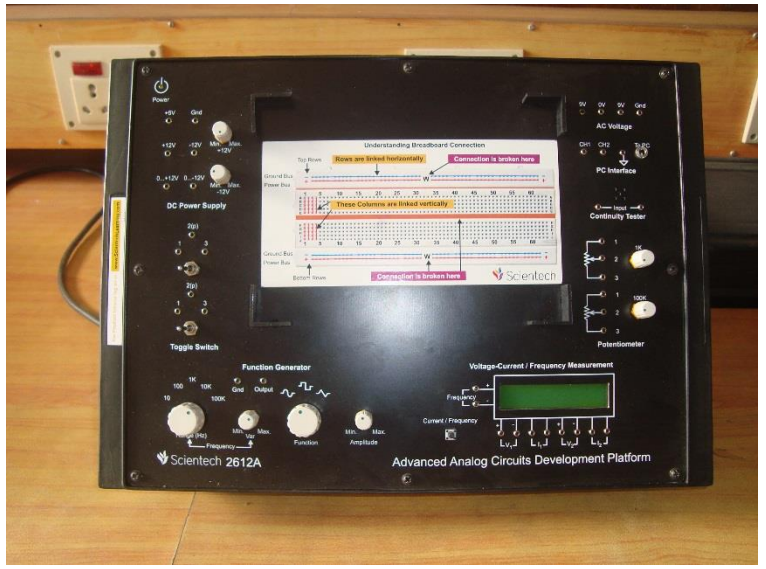

scientific
POWER SUPPLY PSD3003
0-30V, 3A
09.1
VDC
FORWARD AND REVERSE BIAS CHARAC
TERISTCS OF PN JUNCTION DIODE

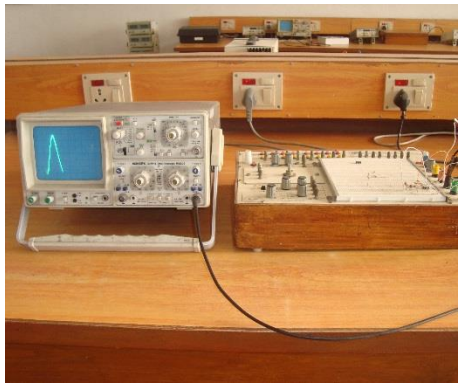

Caddo 803
30MHz 2 Channel 4 Trace Oscilloscope
HALE WAVE AND FULL WAWE
RECTIFIR CIRUITS

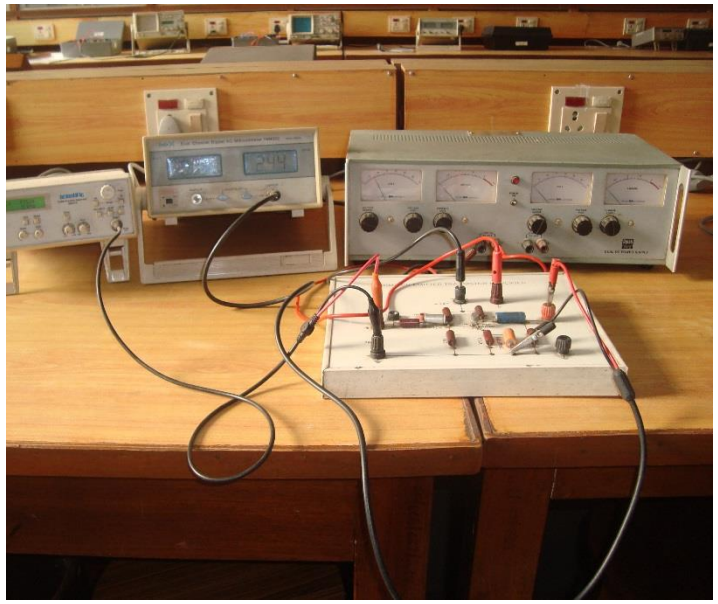
00.3
23.1
11.6
VDC
ZENER DIODE

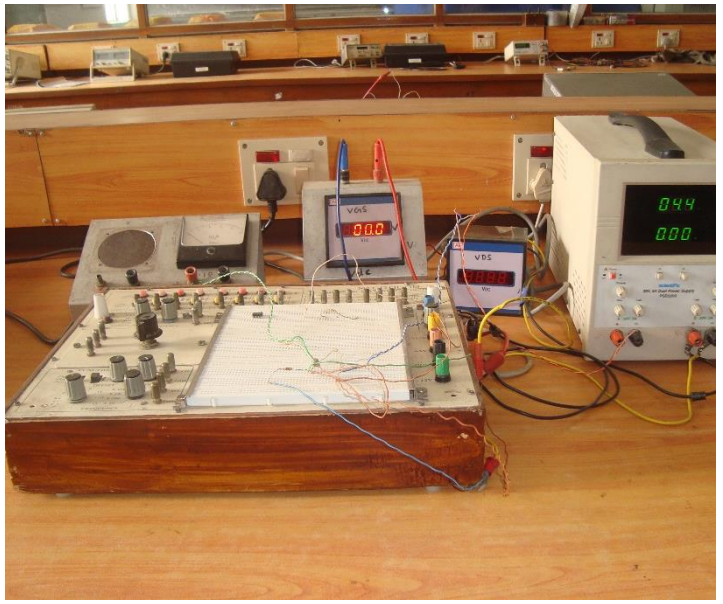

scientific
FUNCTION GENERATOR
HM5030-4
1000
scientific 30MHz Oscilloscope HM203

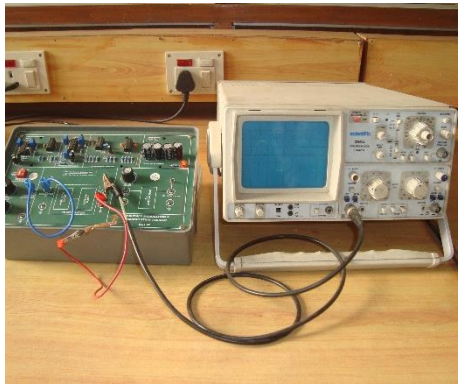

MICROLAB-II
LOGIC DATA
CLOCK GENERATOR
TRANSFORMER
FUNCTION GENERATOR
FREQUENCY

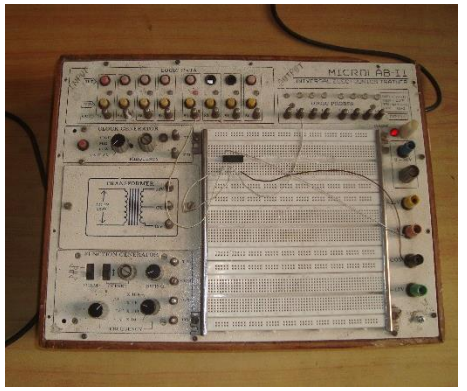

Understanding Breadboard Connection
Rows are linked horizontally
Connection is broken here
These Columns are linked vertically
Scientech
DC Power Supply
AC Voltage
PC Interface
Continuity Tester
Toggle Switch
Potentiometer
Function Generator
Voltage-Current / Frequency Measurement
Scientech 2612A
Advanced Analog Circuits Development Platform

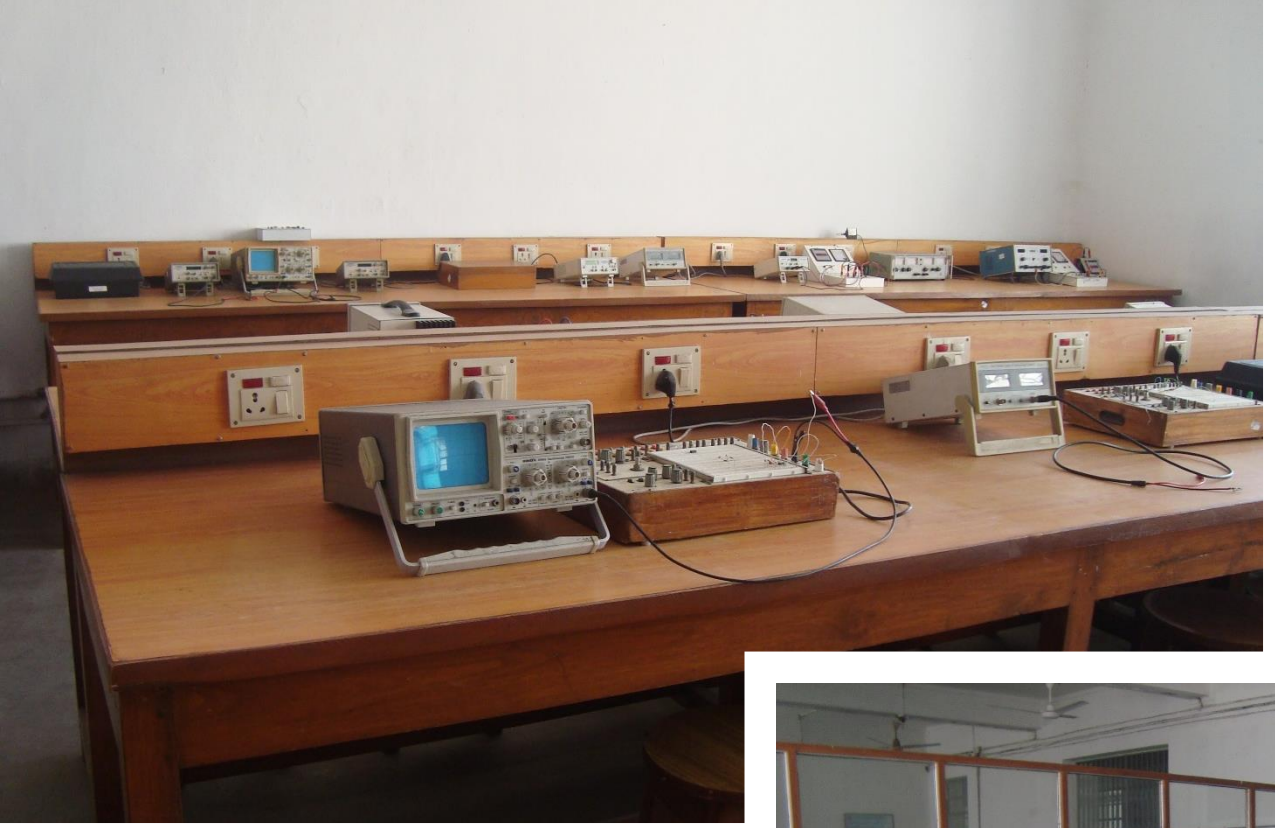





VGS
VDS




MICROLAB-II



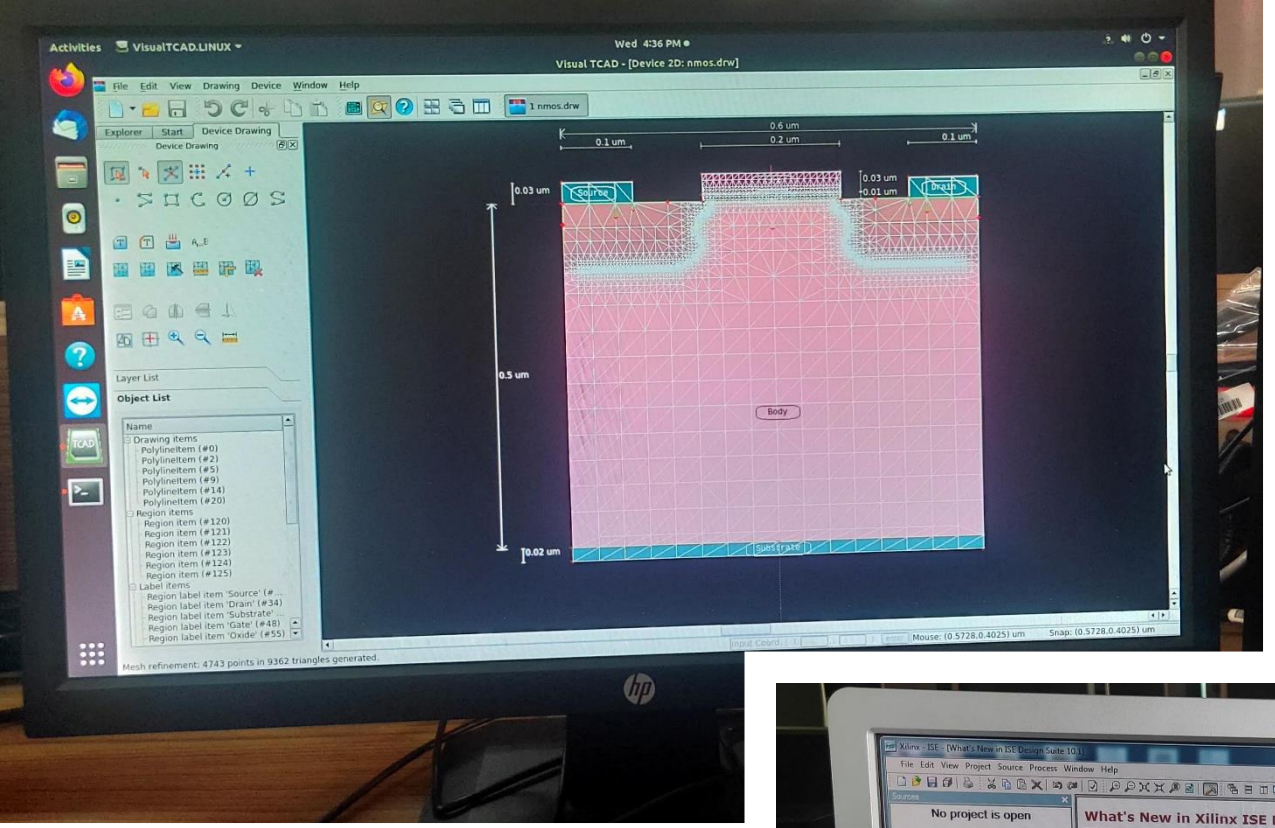
Scientech
AB26
FET Amplifier
DC Power Supply
AC Voltage
PC Interface
Continuity Tester
Toggle Switch
Potentiometer
Function Generator
Voltage-Current / Frequency Measurement
Scientech 2612A
Advanced Analog Circuits Development Platform

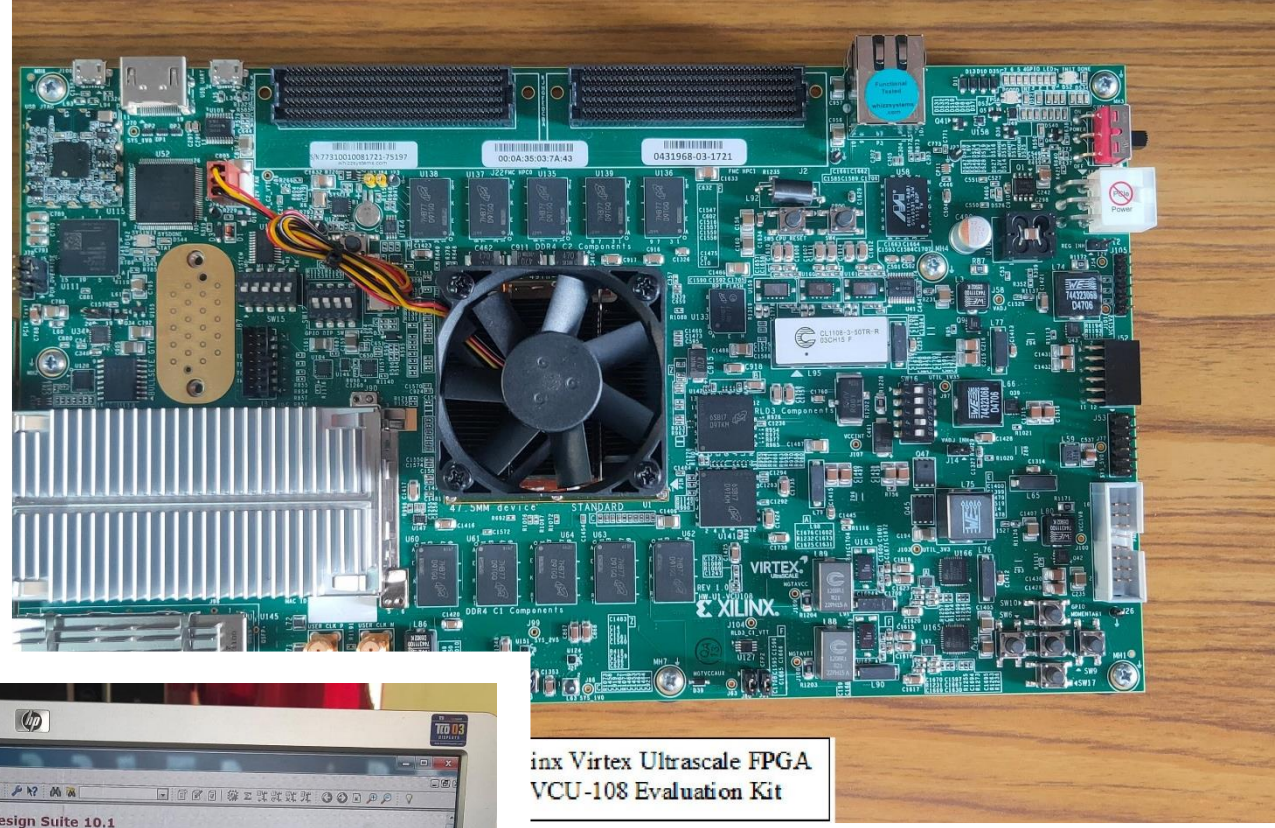
Scientech
AB 04
Transistor Characteristics
Common Emitter (NPN)
DC Power Supply
AC Voltage
PC Interface
Continuity Tester
Toggle Switch
Potentiometer
Function Generator
Voltage-Current / Frequency Measurement
Scientech 2612A
Advanced Analog Circuits Development Platform

Embedded System Design Lab

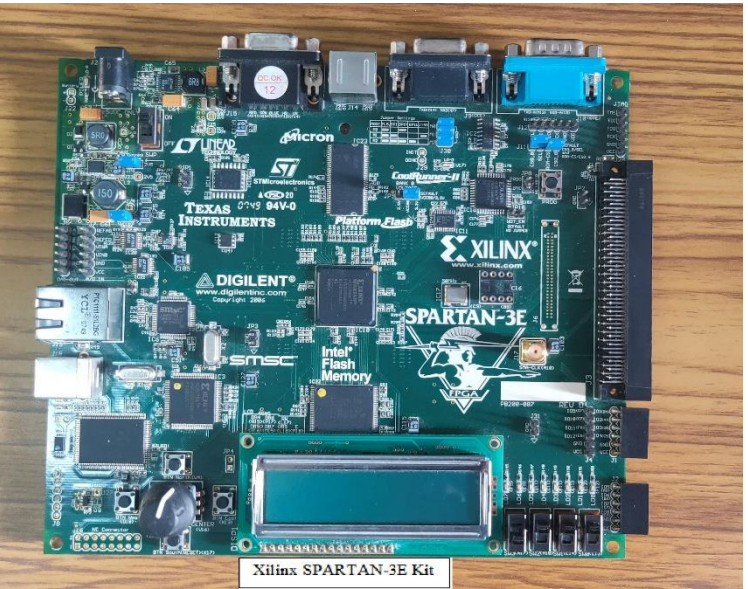
For PG students only

EMBEDDED SYSTEM LAB
EMBEDDED SYSTEM AND DEVICES LAB
EMBEDDED SYSTEM LAB (FREESCALE)

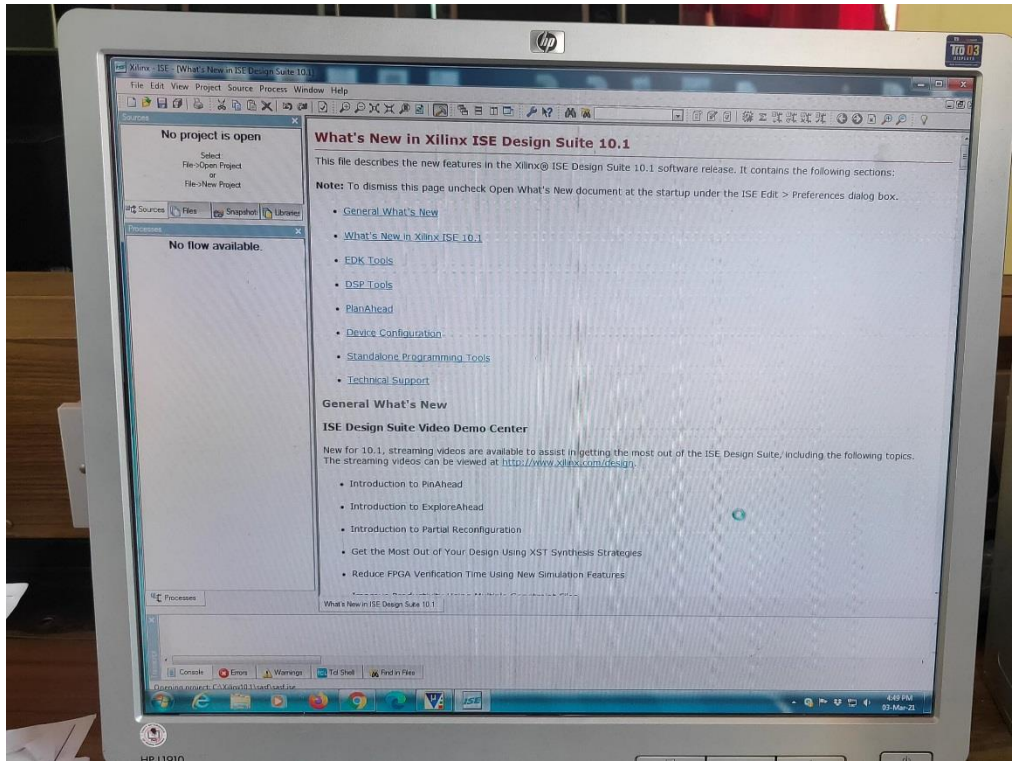




inx Virtex Ultrascale FPGA
VCU-108 Evaluation Kit



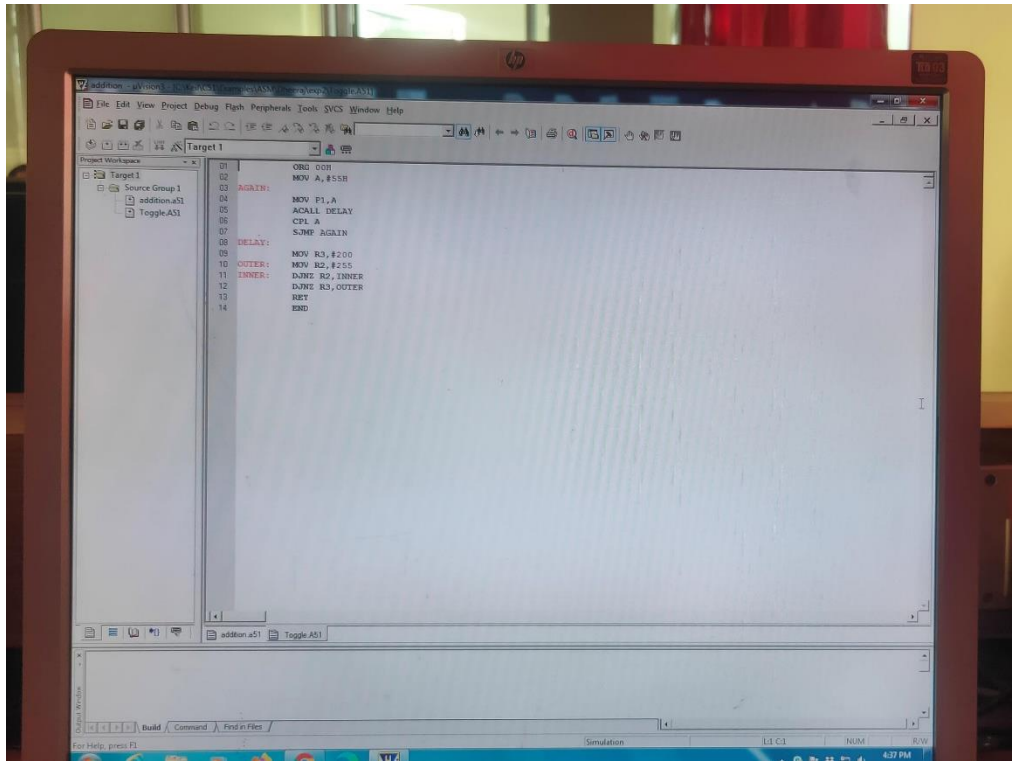
Xilinx SPARTAN-3E Kit

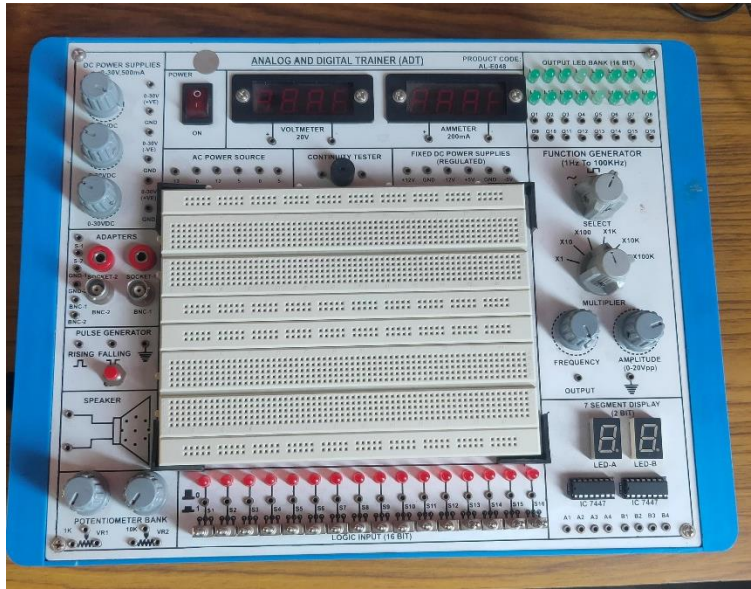


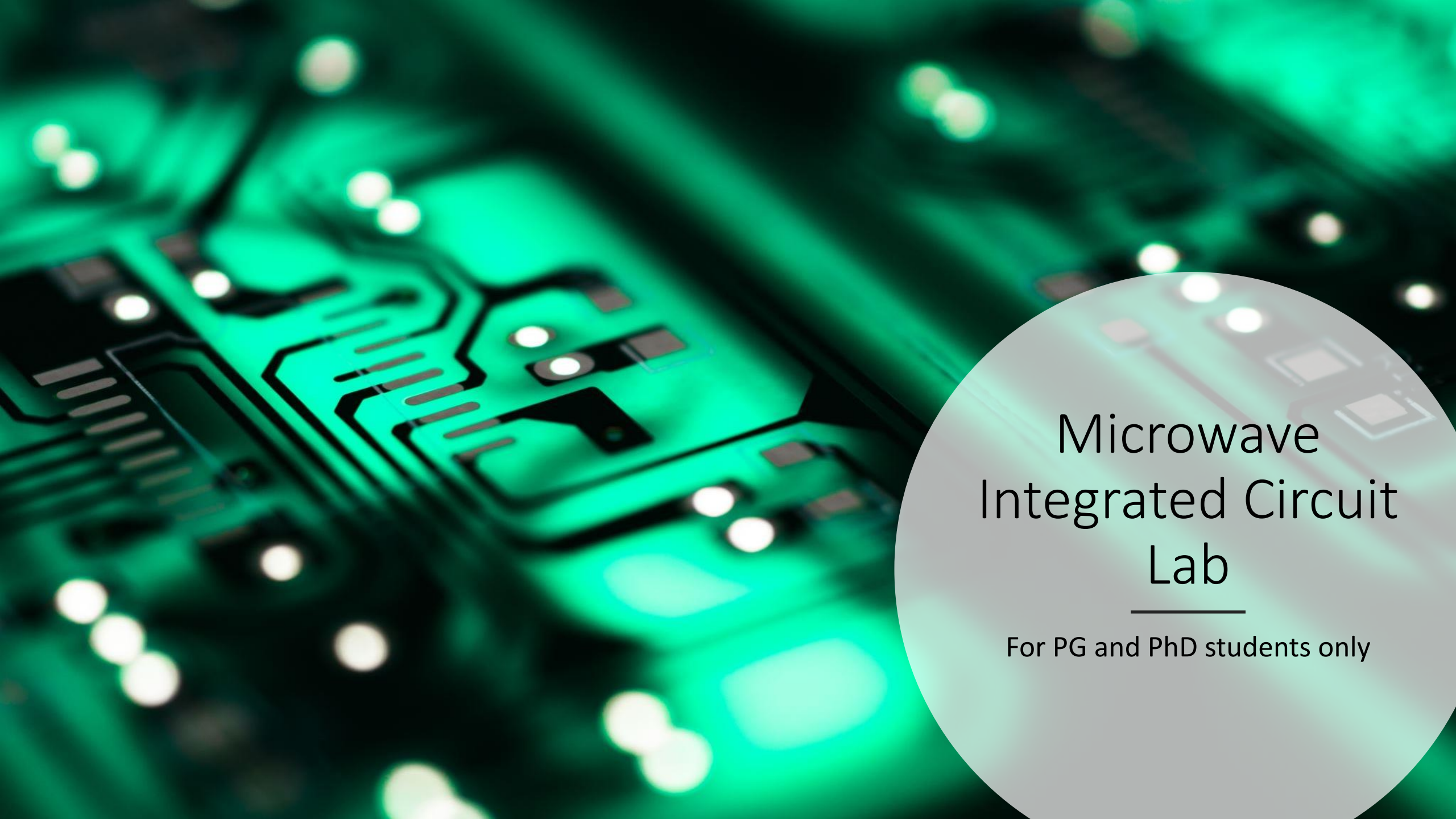
CPLD PINOUT
FPGA PINOUT
Note : IOB : NC pins available to the user for external use without disconnecting the hardware
XILINX

Tektronix
TBS 1072B
Digital Oscilloscope
70 MHz
1 GS/s
Multipurpose
Press to Select
Cursor
Measure
Help
Save Recall
Default Setup
Function
Utility
Vertical
Math
M
Position
FFT
1
Menu
2
Ref
R
Scale
Horizontal
Position
Acquire
Scale
300V
300V CAT II
Ext Trig
Enabling Efficiency
Rich set of automated measurements and analysis functions

READ
LBIT
SIG
ERASE
BLANK
PRGM
VRFY
STEST
AUTO
EDIT
DEVICE
ENTER
FP-8903
PROGRAMMER
Oriole


Target 1
ORG 00H
MOV A,#55H
AGAIN:
MOV P1,A
ACALL DELAY
CPL A
SJMP AGAIN
DELAY:
MOV R3,#200
OUTER: MOV R2,#255
INNER: DJNZ R2,INNER
DJNZ R3,OUTER
RET
END


ANALOG AND DIGITAL TRAINER (ADT)
VOLTMETER
AMMETER
AC POWER SOURCE
CONTINUITY TESTER
FIXED DC POWER SUPPLIES (REGULATED)
FUNCTION GENERATOR (1Hz To 100KHz)
PULSE GENERATOR
SPEAKER
MULTIPLIER
7 SEGMENT DISPLAY (2 BIT)
POTENTIOMETER BANK
LOGIC INPUT (16 BIT)



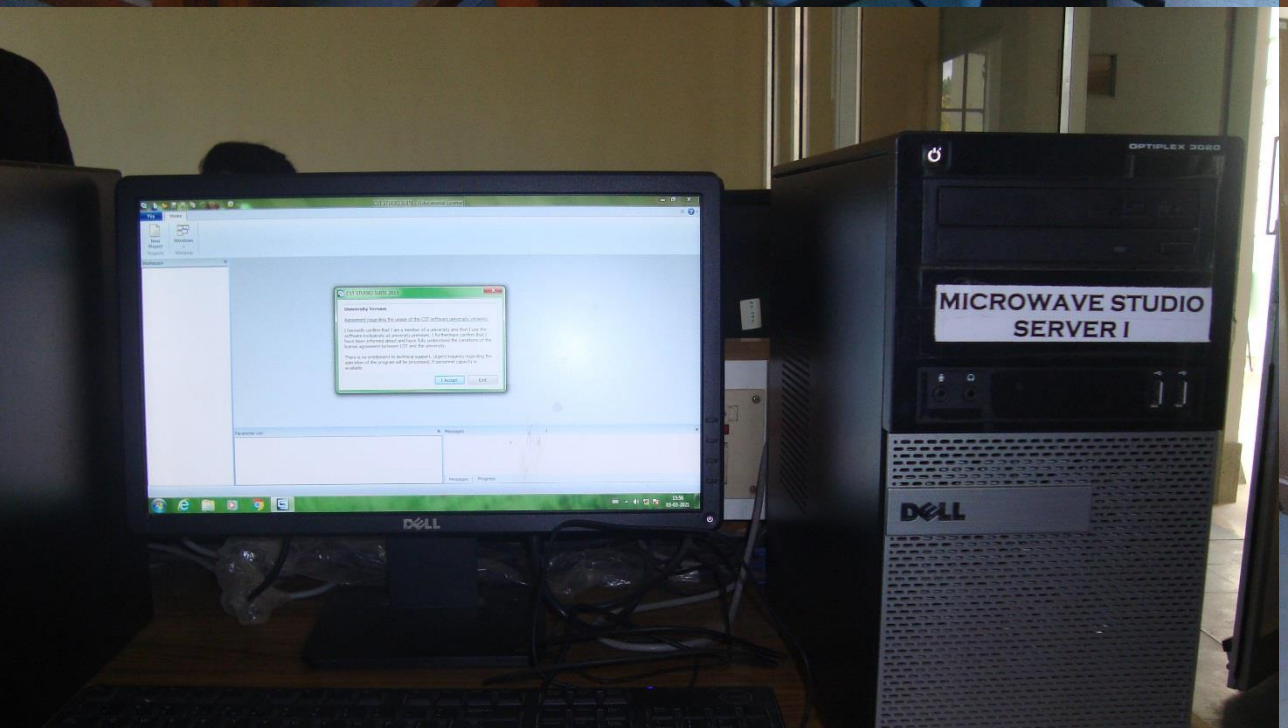
Microwave Integrated Circuit Lab

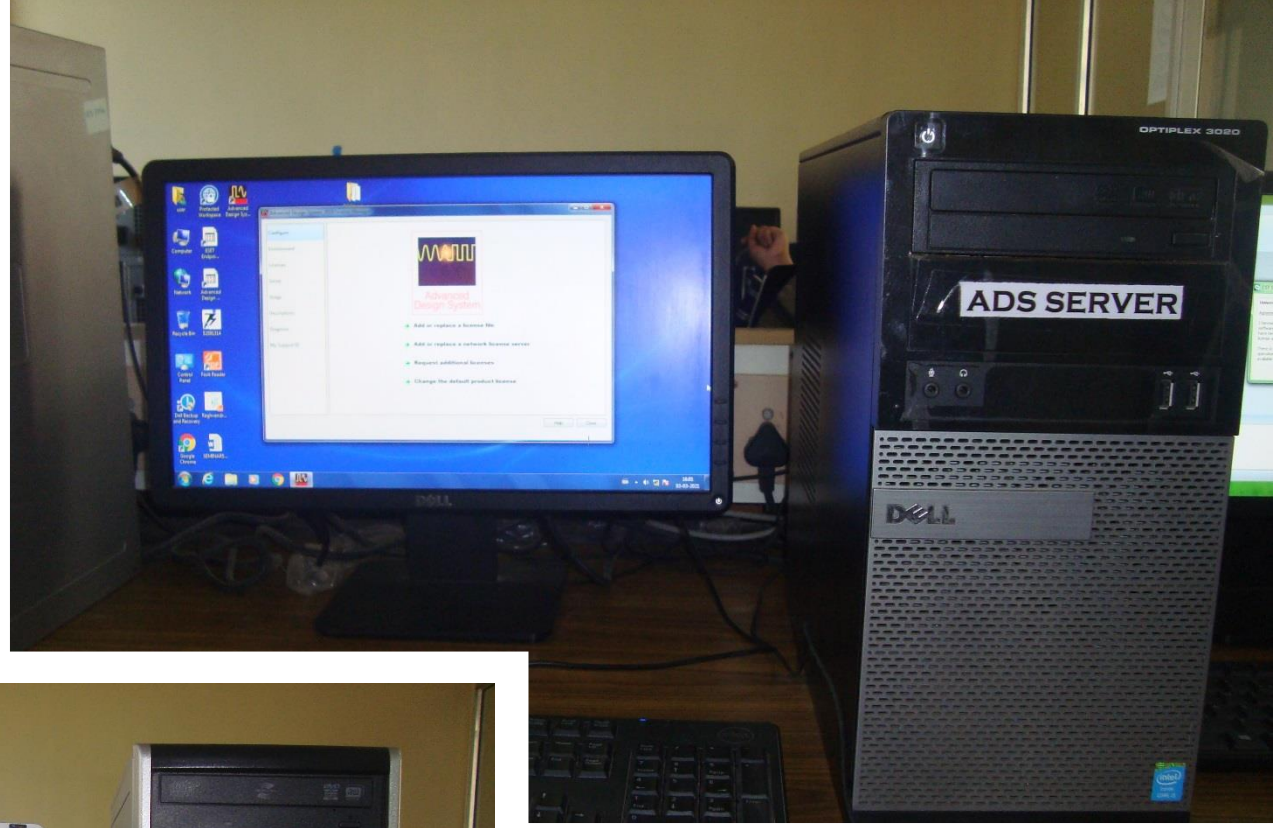
For PG and PhD students only

UV EXP OSURE UN
E.C.E

E.C.E
Thermotech
MAINS INDICATOR
FAN
OFF
OVEN
SCIENTIFIC

SCIENTIFIC
SPINER

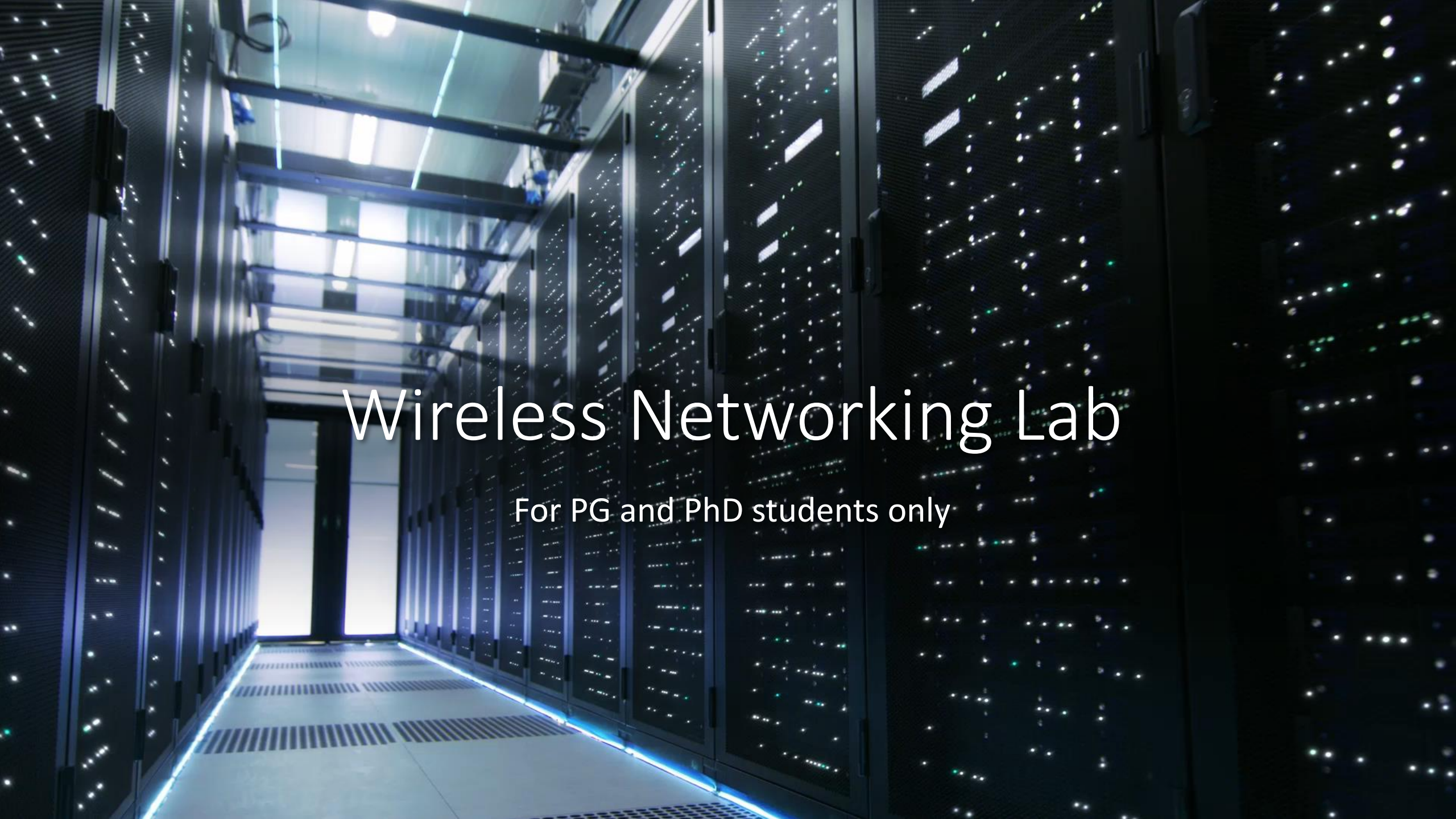

OPTIPLEX 3020
MICROWAVE STUDIO
SERVER I
DELL
DELL


OPTIPLEX 3020
ADS SERVER
DELL

SONNET SERVER

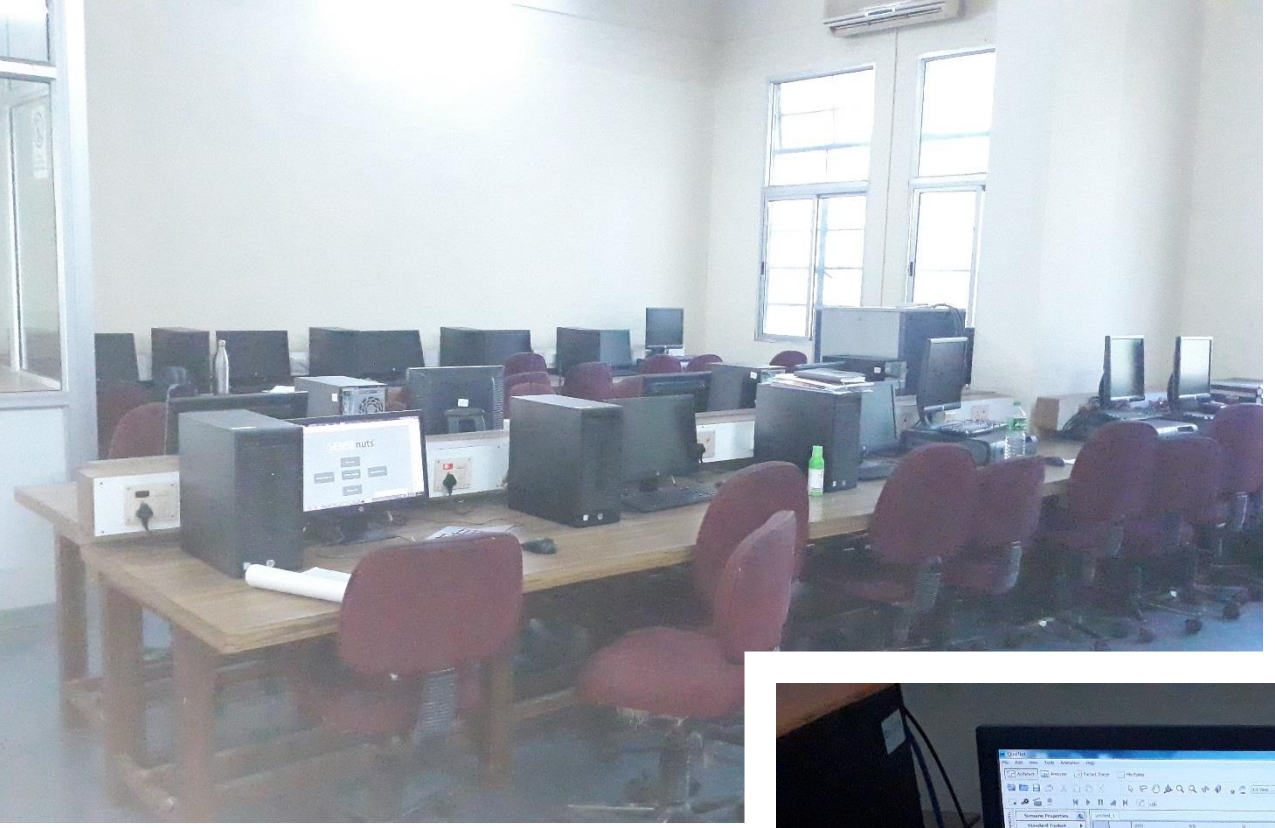
AWR SERVER

MIC LAB

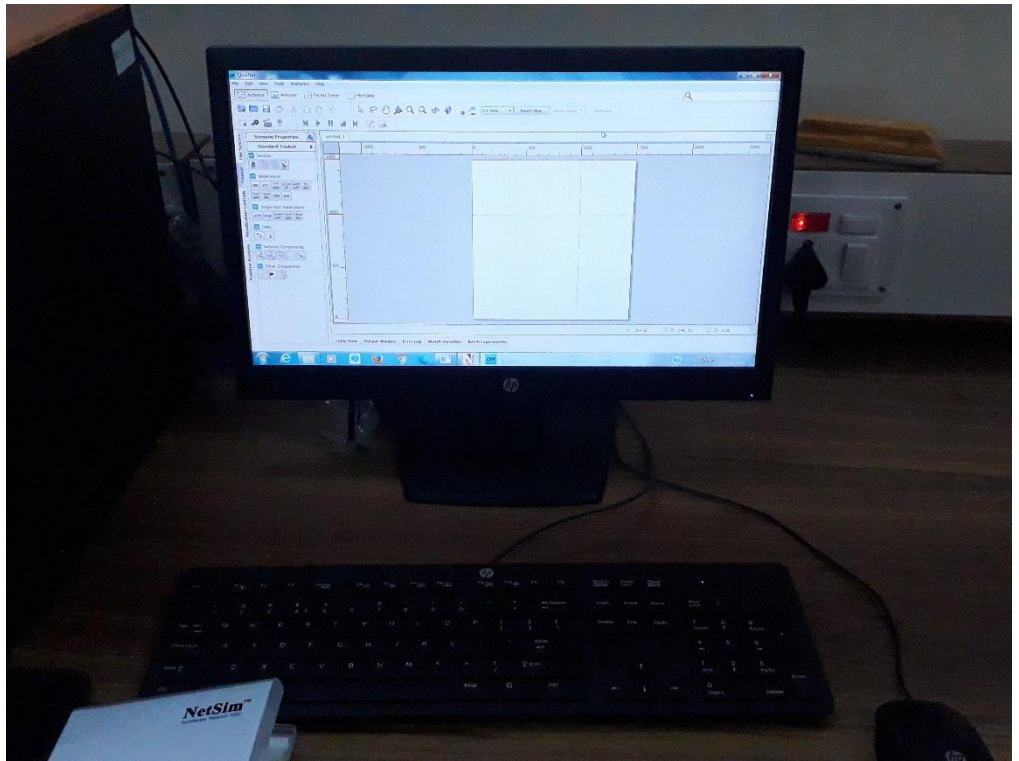


Wireless Networking Lab

For PG and PhD students only



WIRELESS NETWORKING LAB
WIRELESS NETWORKS LAB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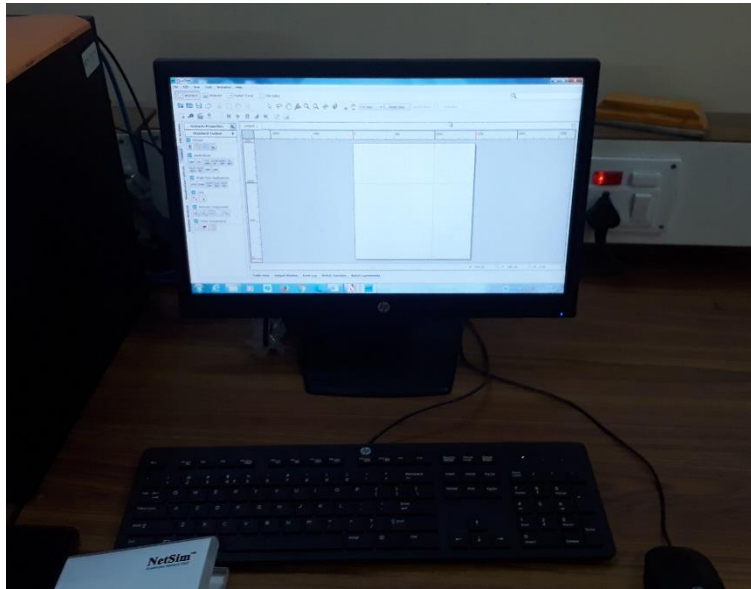
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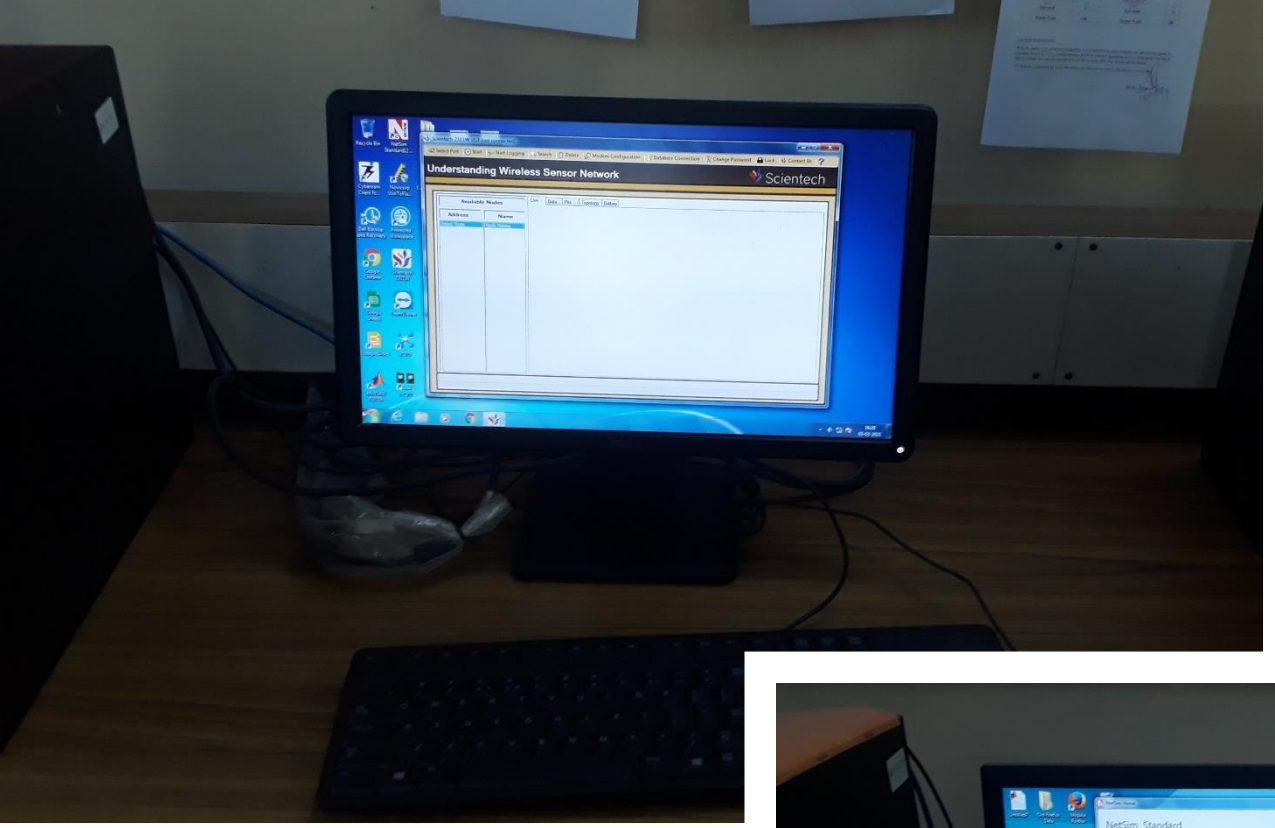
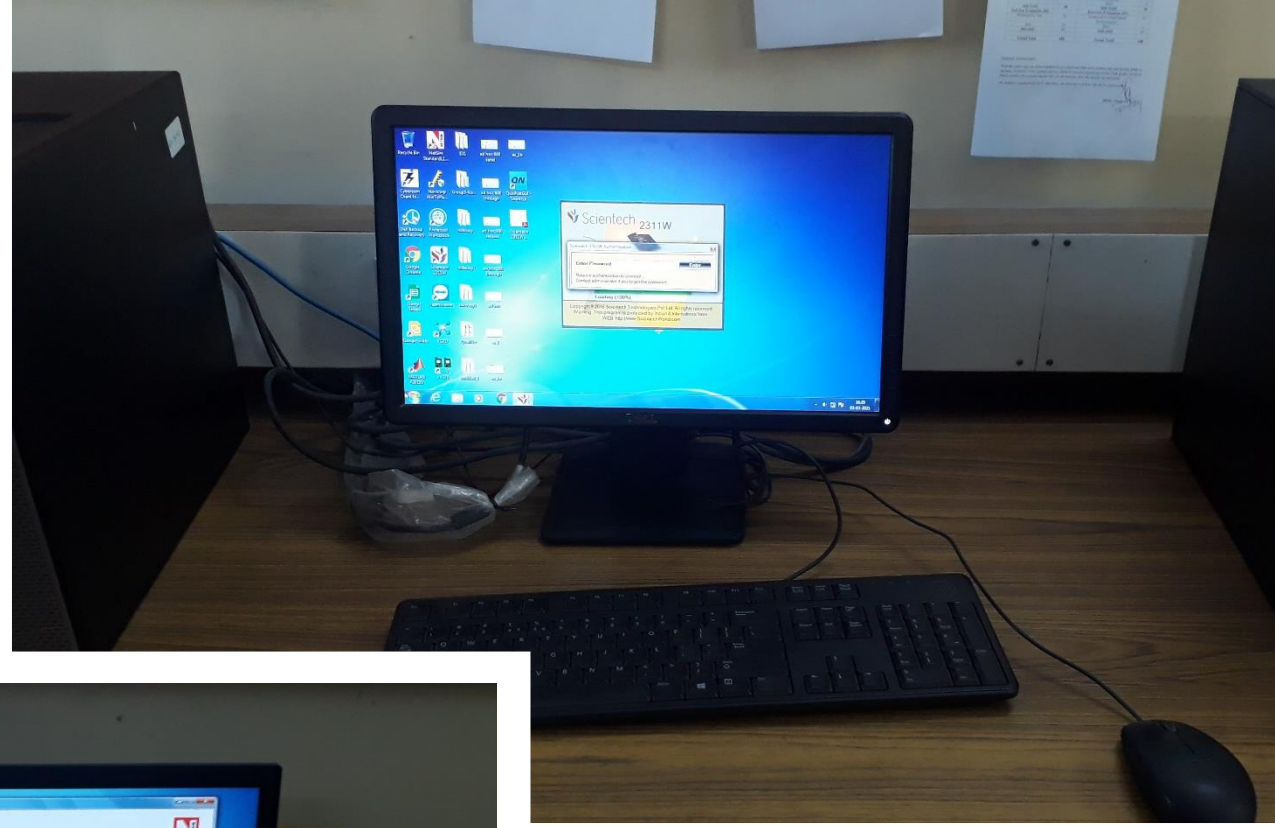
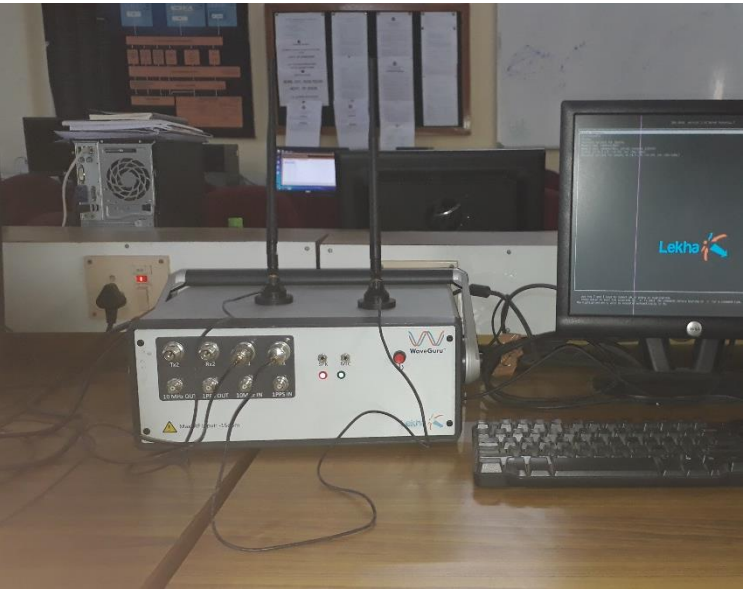
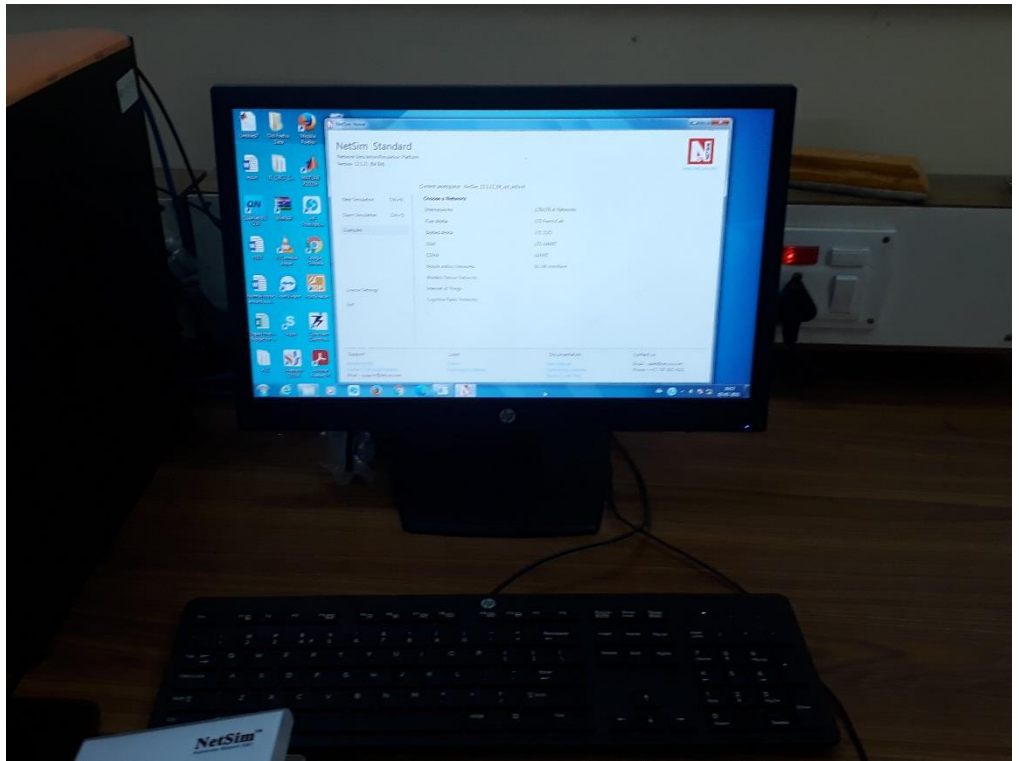
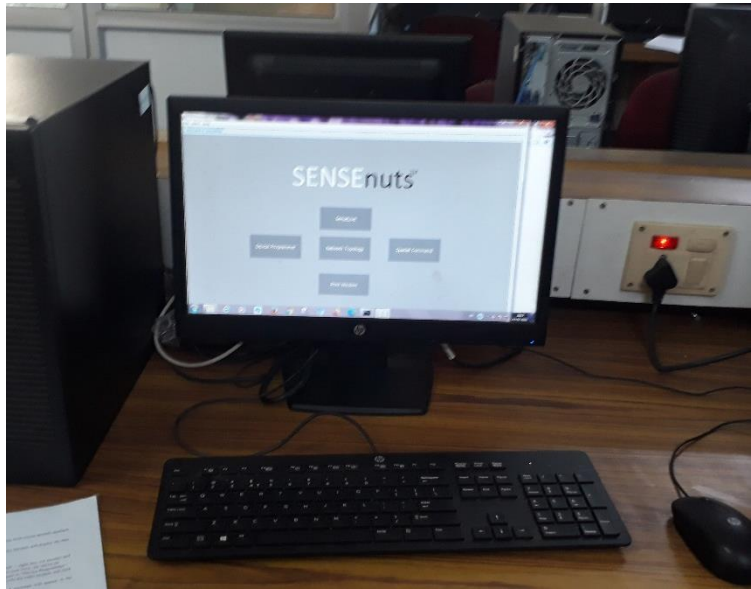
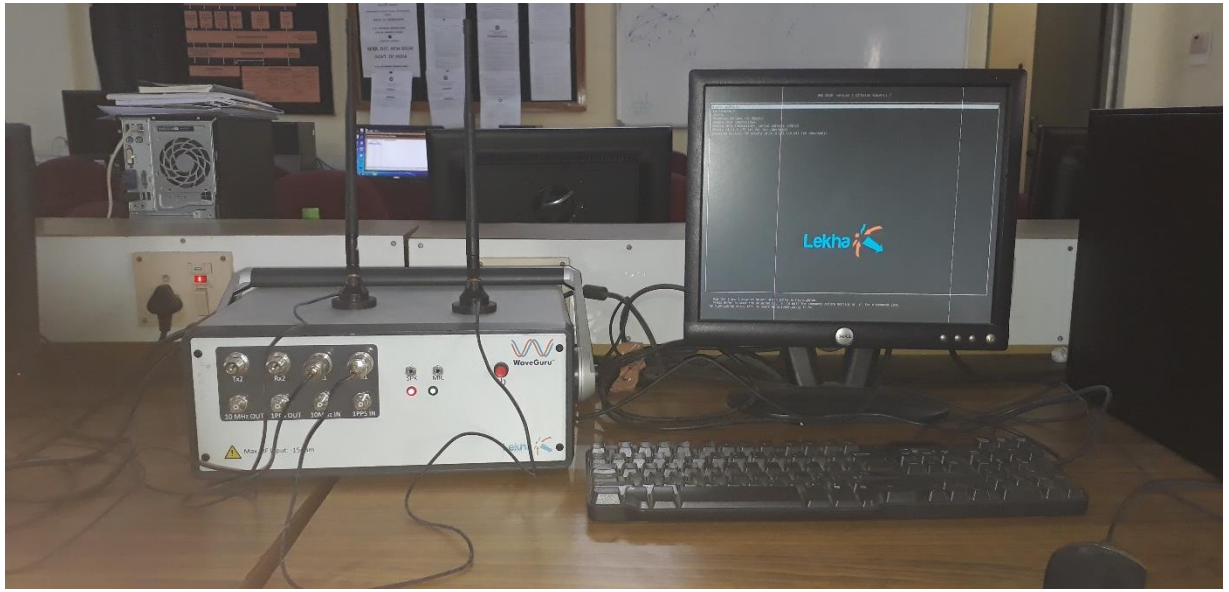

Understanding Wireless Sensor Network
Scientech

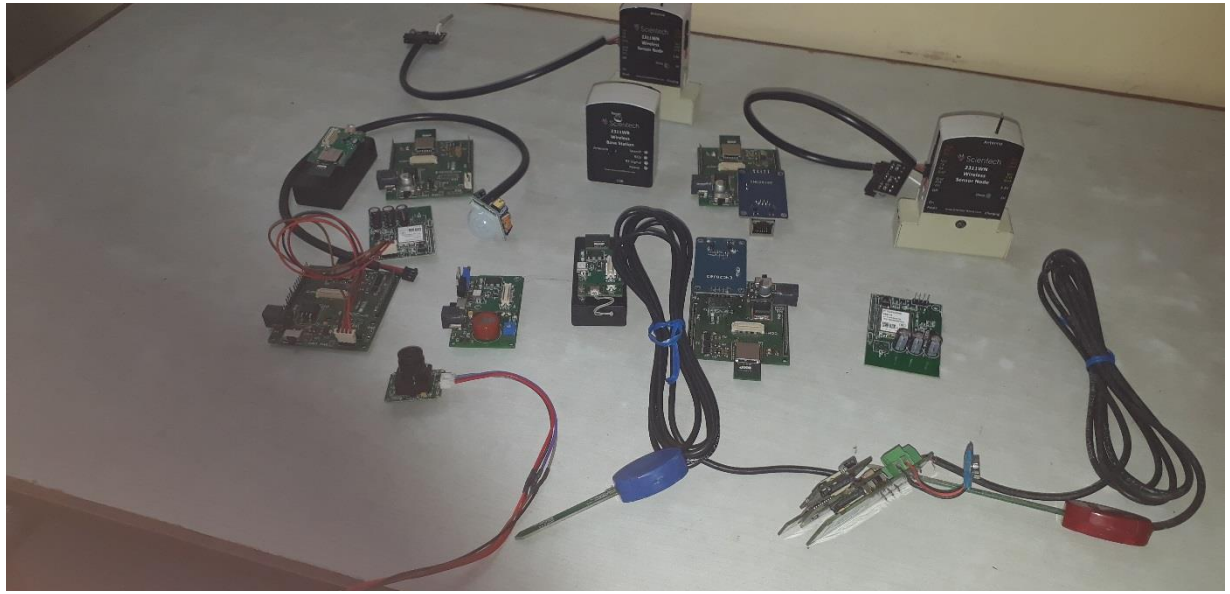

Scientech 2311W


Lekha


NetSim Standard
NetSim


SENSEnuts


Lekha
WaveGuru



Major Equipment in the department

- **Vector Network Analyzer (**10 MHz- 20 GHz**)**
- **Anechoic Chamber**
- **Spectrum Analyzers(**100 KHz to 7 GHz**)**
- **Mixed Domain Oscilloscope**
- **Advanced Microstrip Trainer Kit**
- **Wideband horn antenna**
- **UV Exposure Unit**
- **Spiner**
- **Laminator**
- **Brain computer interface module**
- **Wireless Sensor Network Module**
- **Sound and Vibration data logger**
- **Communication Modules**
- **FBG Interrogator**

Major software in the department

- **MULTISIM**
- **COMSIM**
- **CADENCE**
- **IE3D**
- **VISUAL TCAD**
- **XILINX**
- **Qualnet 6.1**
- **NetSim (V11.0)**
- **LabVIWE**
- **Automation studio**
- **PLC**

Major Research Areas

- **RF circuits, Antenna design & EMI-EMC**
- **Optical and Wireless Communication**
- **VLSI and Embedded System Design**
- **Sensors and Instrumentation**
- **Signal Processing and Computer Vision**

RF circuits, Antenna design & EMI-EMC Group

Dr. Nisha Gupta

Dr. V.R. Gupta

Dr. Srikanta Pal

Dr. Neela Chattoraj

Dr. G.K. Mishra

Dr. A.K. Tiwary

Dr. D.K. Upadhyay

Dr. C. Sarkar

Research Outcomes

Figure1: RF Circuit design using Computational Electromagnetic (CEM) tools

Figure 2: Mask formation (Negative) for RF Circuit Fabrication

Figure 3: Fabrication stages for RF Circuit using MMIC Technique.

Figure 5: Photograph showing the three individual OAM Antenna using single patch antenna. (a) +1 mode OAM antenna. (b) -1 mode OAM antenna. (c) 0 mode OAM antenna

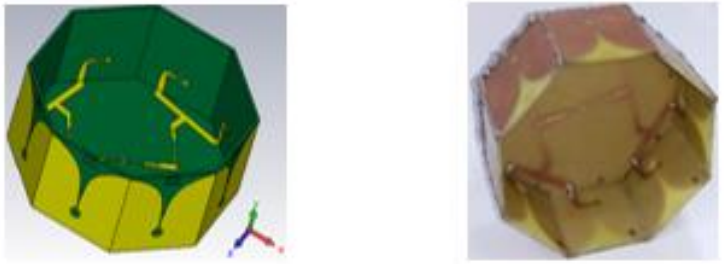


Figure 6: 8-element Vivaldi circular array for generation of OAM mode l = 0; (a) Schematic view (b) Fabricated Vivaldi array

Figure 7: PMMA based antenna implanted in Muscle phantom

Research Outcomes

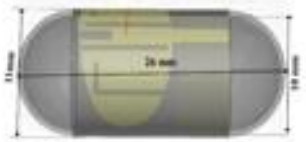


Figure 8:PMMA based ingestible antenna

Figure 9: FSIW filter for Wi-Fi6E application

Figure 10: A compact parallel coupled meander lines shaped CRLH-TL based symmetric quasi-0 dB coupler

Figure 11: Design of the quasi-0 dB backward wave-coupled line coupler using CRLH-TL based on stepped-impedance open stub-loaded dual-mode resonator

Figure 12: A Compact Planar Diplexer based on Via-Free CRLH TL for WiMAX and WLAN Applications

Figure 13: Highly compact UWB bandpass filter based on composite right/left-handed transmission line and meander fractal like ring slot in ground

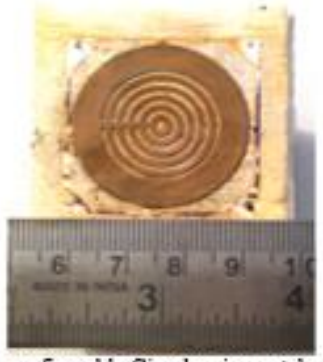


Figure 14: Fabricated Layout of BW reconfigurable Circular ring patch antenna. Resonance frequency 3.5 GHz and BW 200 MHz

Research Outcomes

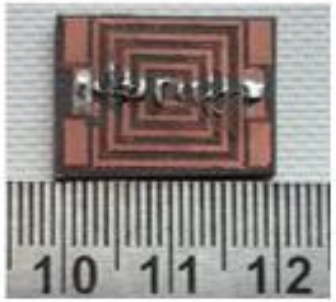


Figure 15: Fabricated Layout of Frequency reconfigurable Square ring Bandpass Filter. Frequency range from3.4-3.6 GHz.

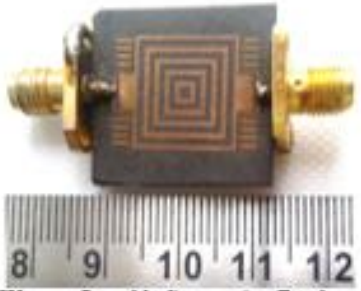


Figure 16: Fabricated Layout of BW reconfigurable Square ring Bandpass Filter. Resonance frequency 3.5 GHz

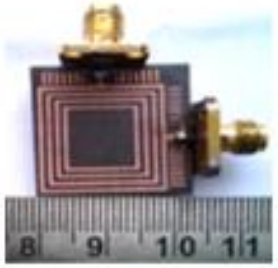


Figure 16: Fabricated Layout of BW and frequency reconfigurable Square ring Bandpass Filter.

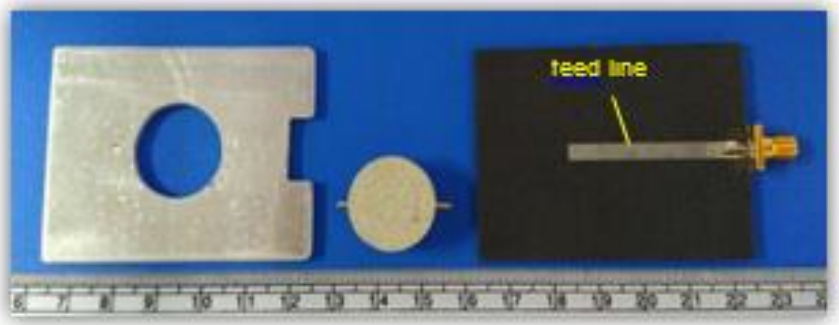


Figure 17: Different units/components (L to R): Grooved ground, resonator block, feeding structure of grounded substrate

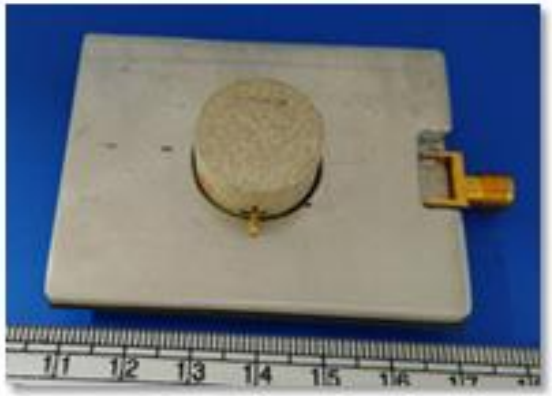


Figure 18: The final prototype of the Dielectric Resonator Antenna

Research Outcomes

Figure 19: Superconducting L band filter in Lovell Telescope, UK

Figure 20: L-Band elliptic HTS Filters response

Figure 21: Superconducting Notch filter used in Green bank Telescope, US

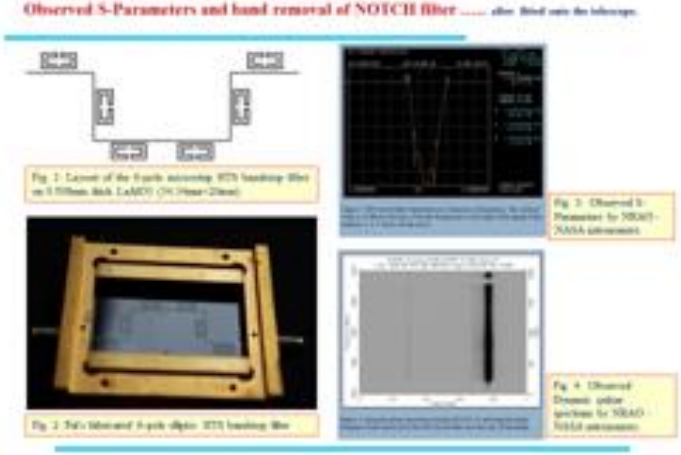


Figure 22: S- Parameter and Band removal Notch filter response of the Green bank Telesc

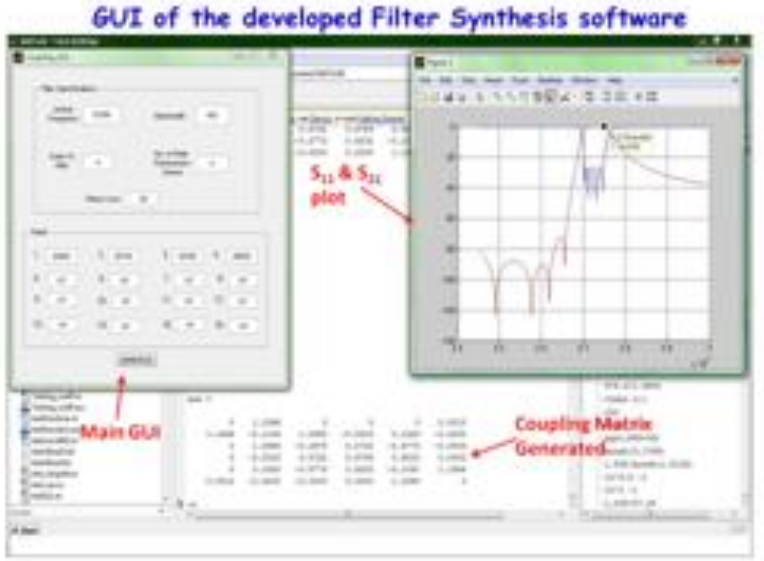


Figure 23: Filter synthesis software for high frequency mobile communication

Optical and Wireless Communication Group

Dr. S.K. Ghorai

Dr. Sanjay Kumar

Dr. Sanjeet Kumar

Dr. Somnath Sengupta

Dr. G.K. Mishra

Dr. N. Biswas

Dr. S. Sidhishwari

VLSI and Embedded System Design Group

Dr. Aminul Islam

Dr. Vijay Nath

Mr. S. Prasad

Dr. Vimal K. Singh Yadav

Dr. Deepti Gola

Dr. Kalyan Koley

Research Outcomes

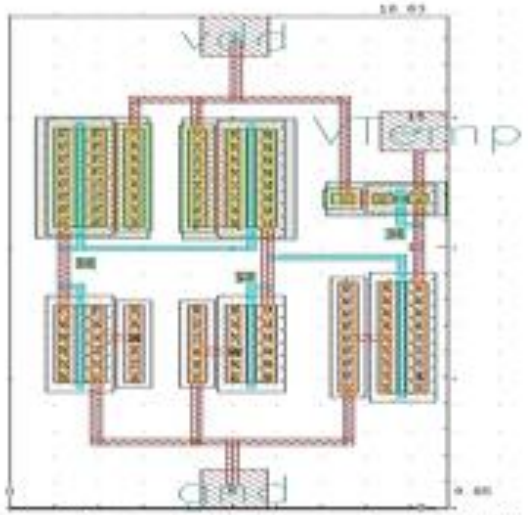


Figure15: Layout of CMOS Temperature Sensor Cell (with measure from -20 0C upto 120 0C) using SCL PDK 180 nm (Software used :Cadence Virtuoso for Design & Mentor Graphics for design verification)

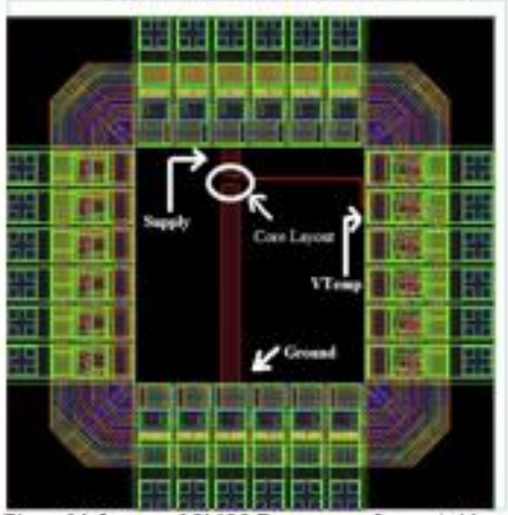


Figure 26: Layout of CMOS Temperature Sensor (with measure from -20 0C upto 120 0C) with Padruing SCL PDK 180 nm (Software used :Cadence Virtuoso for Design & Mentor Graphics for design verification)

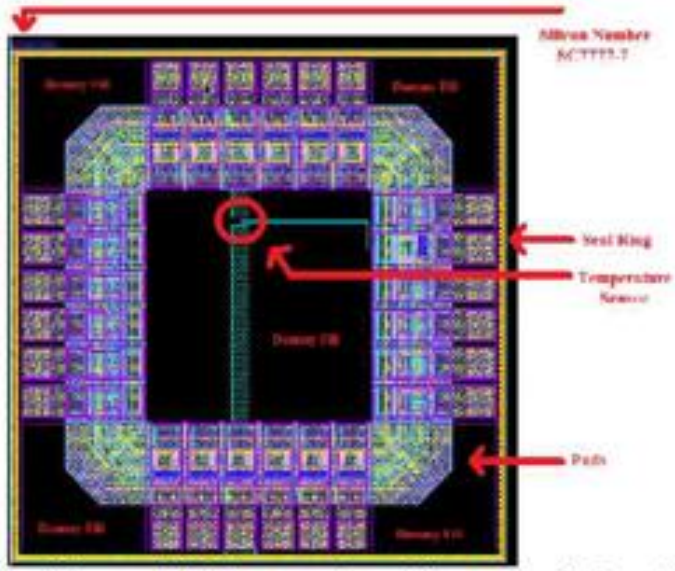


Figure 27: Layout of CMOS Temperature Sensor (with measure from -20 0C upto 120 0C) seal ring & silicon numbering SCL PDK 180 nm (Software used :Cadence Virtuoso for Design & Mentor Graphics for design verification)

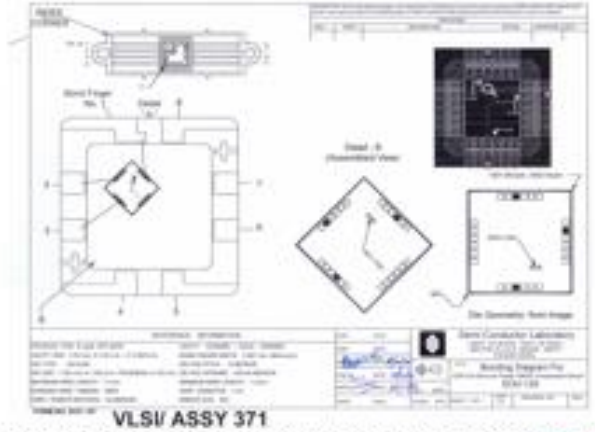


Figure 28 Fabrication view of CMOS Temperature Sensor (with measure from -20 0C upto 120 0C) of SCL 180nm

Research Outcomes

Figure 29 Layout design of Ultra Low Power CMOS Temperature Sensor (with measure from -20 °C upto 120 °C) for Aerospace Application in VLSI Design Laboratory

Figure 30: ISRO funded project demonstration in VLSI Design Laboratory

Figure 31: Array of Painless Microneedle array for transdermal drug delivery which are developed as an alternate to painful hypodermic syringes. The microneedles are self administrable and painless.

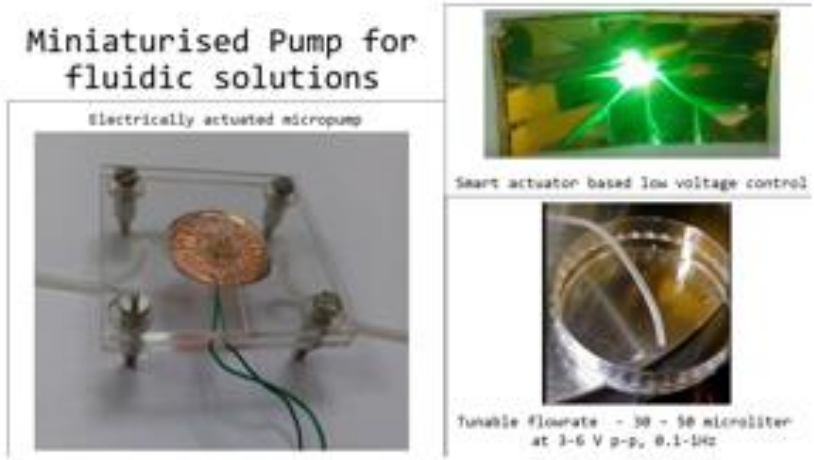


Figure 32: MEMS based miniaturised pump for fluidic solutions. The micropump can pump fluid at a tunable flow rate of 30-50 microliter which is required for drug delivery devices at low voltages 3-5 V p-p and frequency 0.1-1Hz.

Research Outcomes

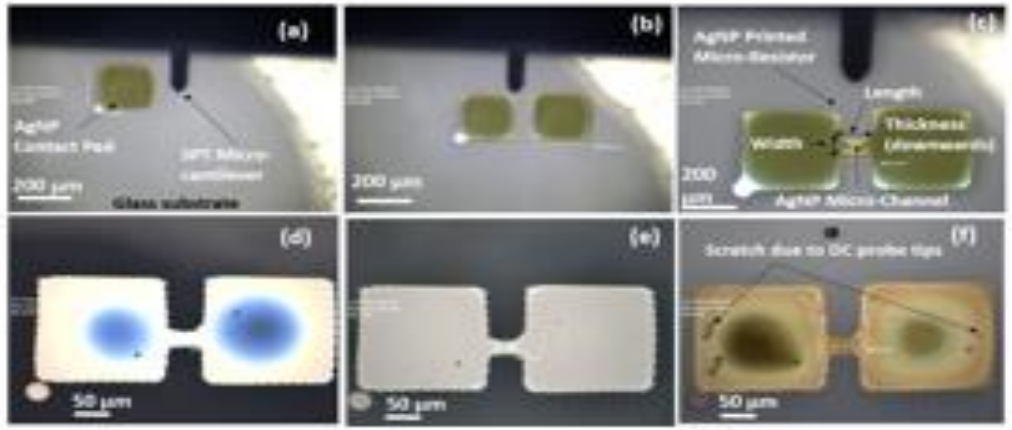


Figure 33: Printed Micro-Resistors (PMRs) fabrication steps, Fabrication steps of the proposed PMR shown using top view of its optical image (a) Left electrode fabrication (b) Right electrode fabrication (c) AgNR channel bridging two electrodes to complete first level of PMR fabrication (d) PMR after 1 hour from printing (e) PMR after annealing (f) PMR after electrical characterization after 1 year [Source:DOI: 10.1109/TCPMT.2019.2954079]

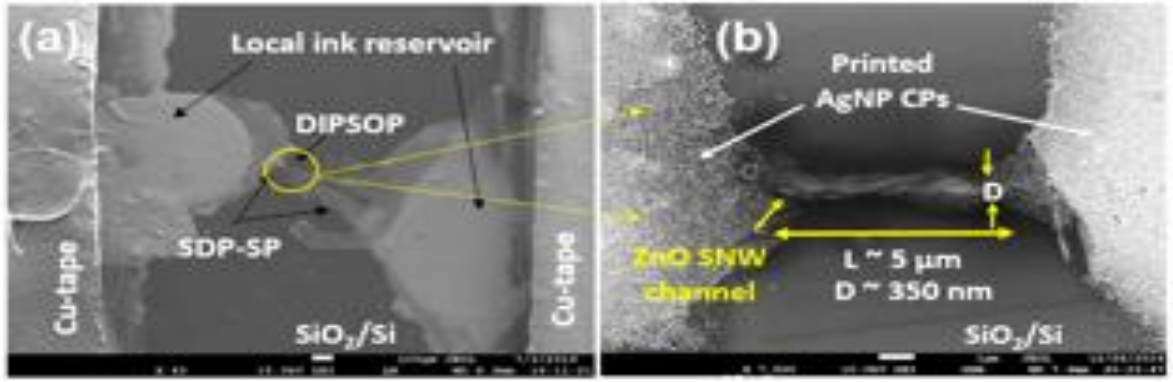


Figure 34: Printed ZnO Single Nanowire Schottky Diode, FESEM image of a representative complete Schottky diode with ZnO Single Nanowire (SNW) channel for NO2 sensing, scale: 100 µm (b) Magnified FESEM image of the channel region with silver nanoparticle (AgNP) printed pads. L, D: Length, Diameter of ZnO SNW [Source:DOI: 10.1109/TED.2020.3001717]

Sensors and Instrumentation group

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Research Outcomes

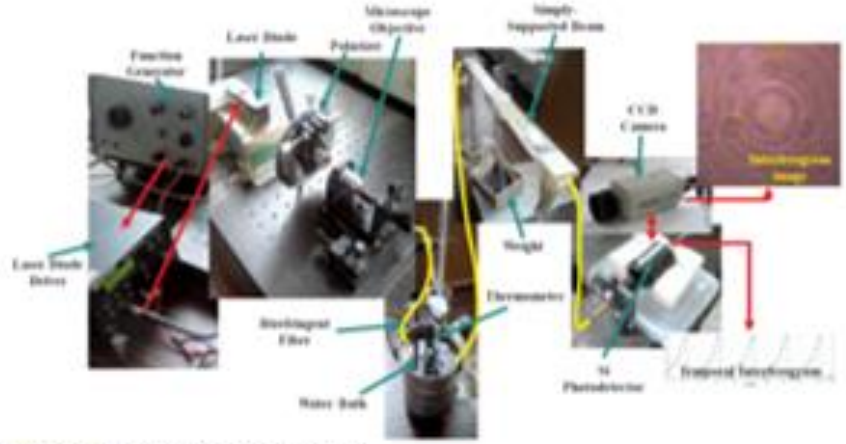

Figure 40: Distributed fiber optic sensing

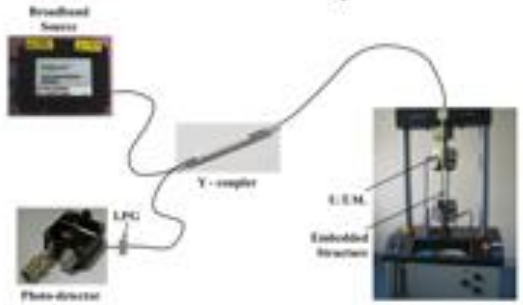

Figure 40: Fiber optic sensor embedded composite material

Figure 41: Microcontroller based low cost automatic metal sheet cutter.

Figure 42: IOT based Trash monitoring system.

Research Outcomes

Figure 43: Electronic walk stick for automatic metal sheet cutter.

Figure 44: Overhead tank water level controller

Signal Processing and Computer Vision Group

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Research Outcomes

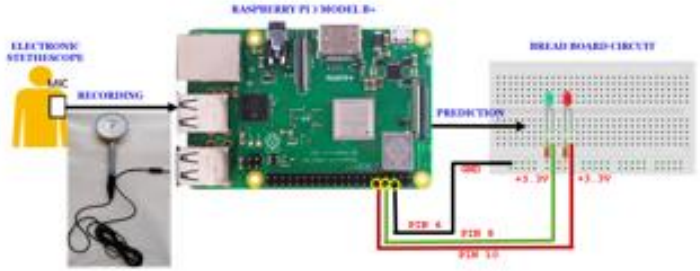

Figure15:Prototype of heart abnormality detection system

Figure 36: Web tool for Rice-blast fungus interaction prediction database

Figure 37: The experimental setup to acquire EEG signals

Figure 38: Pebrin disease identification system

Our Extension Centers

Sl No	Name	Courses Offered	Year of establishment	Intake	Number of Faculty
1	Patna center	UG ECE	2006	60	10
		PG (Wireless Communication)	2013	18	
2	Jaipur Center	UG ECE	2004	60	06
3	Deoghar Center	UG ECE	2007	60	10

List of faculty at Patna Center

Sl. No.	Name	Specialization/field
1	Dr. Shahiruddin	Photonic crystal Fibre, PCF Sensor
2	Dr. Shipra Mishra	Instrumentation, Signal Processing
3	Dr. Megha Dadel	Antenna Design
4	Dr. Ritesh Kumar Badhai	Antenna Design, Antenna design for Biomedical Applications
5	Dr. Atul Kumar Pandey	MAC Protocols for Wireless Sensor Networks, Wireless Body Area Networks, and IoT WSN
6	Dr. Shweta Jha	Energy Harvesting, VLSI Design
7	Dr. Priyadarshi Suraj	Antenna Design, Wireless Communication
8	Dr. Rajeev Ranjan	Microwave, Wireless Communication
9	Dr. Gudibandi Bharath Reddy	MIMO, Antenna design and considerations
10	Dr. Nilay Pandey	Molecular communication & Internet of Nano-things

List of faculty at Deoghar Center

Sl. No.	Name	Specialization/field
1	Dr. R.K.Lal	Optoelectronics & Semiconductor Device Modelling, Fiber Optic Communication
2	Dr. Mainak Mukhopadhyay	Digital System Architecture, Numerical Techniques in Electromagnetic, Adaptive Signal Processing and MIMO System
3	Dr. Chinmay Chakraborty	Wireless Communication, IoT in Healthcare
4	Vikash Sharma	Communication System
5	Sridhar Chintala	Microelectronics, VLSI Design
6	Sutapa Mondal	Wireless Communication
7	Payal Bhardwaj	Semiconductor Devices, Basic Electronics, Digital Electronics, Electromagnetic Field Theory, Antenna and Wave Propagation
8	Akash Kumar Gupta	Signal Processing and Communication
9	Akhilesh Kumar Roy	Microelectronics, VLSI Design
10	Mahendra Kumar Das	Optoelectronic Devices, Instrumentation, VLSI, Semiconductor devices, Fiber Optics

List of faculty at Jaipur Center

Sl. No.	Name	Specialization/field
1	Mr. Ankur Agarwal	Signal and Image processing, Integral Transforms
2	Mrs. Jyoti Sharma	VLSI design, Analog Circuit Design, Nanotechnology, Low power circuits, Technologies beyond CMOS
3	Mr. Snehanshu Shekhar	Wireless sensor network, Instrumentation and Control.
4	Mr. Gaurav Jain	Bio-Medical Instruments Using Artificial Intelligence
5	Mr. Deepak Chaturvedi	Microwave Communication, Optical communication
6	Mr. Puneet Sharma	Fabrication and design of electronic sensors, error codes, and digital circuit design.

Thank you