



# LAB BROCHURE

**Department of Electrical Engineering  
Faculty of Engineering  
Najran University**

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## INTRODUCTION

This Brochure gives an overview of the Laboratory facilities of Electrical Engineering Department of Najran University. It briefs on Office, Classroom and Library support also. The department has currently eight labs in which eight dedicated labs and three course-based experimental works are performed. Safety Regulations are also included in the brochure, which is posted in each lab. All labs and 20 dedicated classrooms are equipped with wireless multimedia projector, Wi-Fi and whiteboard. The lecture notes and all course materials can also be provided to the students by the e-learning systems. Most of the textbooks are available in the library in adequate numbers. The students and faculty members can search any required books using a smart search engine of the library website. Books are borrowed for an academic semester. All Faculty members are supported in every aspect by the college for their lecture, research and other activities.

## SAFETY REGULATION GUIDELINES

1. Make sure that you know the location of **Fire Extinguishers and First Aid kit and Emergency exists** before you start your experiments.
2. Strong closed shoes to be worn in laboratory.
3. Students are under supervision of laboratory technician or course instructor during the experiments.
4. **Do not** attempt to operate any machine before you fully understand its mechanism, and be sure to know how to stop the machine before you start it.
5. Always **STOP** the machine before measuring, cleaning or making any adjustment.
6. **Never** operate a machine unless all safety guards are in place.
7. **Do not** attempt to stop a machine with your hands.
8. **Never** have more than one person operate the machine at one time .
9. Remember, **Safety First** and do all your actions smoothly when moving heavy equipment.
10. **STOP** the machine and turn the power off before you leave the lab.
11. Handle tools and equipment with extreme care and return tools to their proper places.
12. Work area **must** be cleaned during experiments.
13. **NO SMOKING**, eating or drinking in the laboratory at all times.
14. Get First Aid immediately for any injury, no matter how small it is.
15. In case of an **emergency, please do not panic call on emergency numbers.**

**Directors of security guards – 0515204385**

**Security monitors - 0515204387**

## LAB DESCRIPTION

### Electric Circuits Lab

**Course Taught:**

213EE1: Electric Circuits Lab

**Experiment Performed:**

Resistors Color Code, Ohm's law, DC Series Circuit (KCL), DC Parallel Circuit (KVL), Series-Parallel DC Circuits, Superposition Theorem, Thevenin's Theorem, Maximum Power Transfer, Series and Parallel Resonant Circuits, Transients in DC Circuits, Electrical Circuit using Multisim Simulation Tools.



**Facilities:**

WiFi, Whiteboard, Wireless Multimedia Projector, PCs, Printer, etc.

Lab Items	Qty
Function Generator 4025	15
PeakTech CRO 60 MHz Oscilloscope	15
DC Power Supply	7
AC Power Supply 4025	5
Analog Multimeter	15
Digital Multimeter	45
Multimedia Projector	2
Function Generator Probe, CRO Probe, Optical Wires, Jumper Probes, Multimeter Probes, Power Cable etc. in adequate numbers.	

## Electronics Lab

**Course Taught:**

334EE1: Basic Electronics Laboratory

**Experiment Performed:**

Characteristics of PN Junction Diode, Characteristics of Zener Diode, Half-Wave & Full-Wave Rectifiers, BRIDGE Rectifier, CB Transistor Characteristics, CE Transistor Characteristics Design Self Bias Circuit, CE Transistor Amplifier, JFET Drain & Transfer Characteristics (CS), JFET Amplifier (Common Source), Transistor as a Switch, Characteristics of UJT, CC Transistor Amplifier



**Facilities:**

WiFi, Whiteboard, Wireless Multimedia Projector, PCs, Printer, etc.

Lab Items	Qty
AC&DC Power Supply	15
DDS Function Generator4030	15
DC Power Supply 6075	15
Digital Oscilloscope	15
[LD] COM3LAB	15
Resistors, Transistors, Diodes, ICs, connectors and other accessories are available in adequate numbers.	

## Power and Machine Lab

### Courses Taught:

325EE-3: Electrical Machines

426EE-3: Fundamentals of Power Systems,

### Experiment Performed:

Voltage and Current Transformation, Voltage Behavior with Resistive Load, Evaluating Efficiency, Short-circuit Voltage and Sustained Short-circuit Current, Voltage Behavior with Inductive or Capacitive Load, Three-phase Transformer Experiments, Experiments with the 230 / 400 V Squirrel Cage Motor.



### Facilities:

WiFi, Whiteboard, Wireless Multimedia Projector, PCs, Printer, etc.

Lab Items	Qty	Lab Items	Qty	Lab Items	Qty	Lab Items	Qty
Controlled Voltage Adjustor	8	Voltage Controller	4	Peak Techrotation Tester	10	Single Phase Current Transformer	4
Multi Functional Instrument	12	Resistive Power Controller	4	PeakTech Multimeter	30	Directional Earth Relay	8
Double Frequency Meter	8	Single Phase Voltage Transformer	3	Digital Oscilloscope	8	Excitation Voltage Controller	4
Directional Time Over Current Relay	8	Three Phase Voltage Transformer	3	COM3LAB Kit	18	Capacitor Motor	4
Over and Under Voltage Relay	8	Magnetic Powder Breaker	4	COM3LAB Kit Box	10	Transmission Line Capacitor	7
Double Voltmeter	8	Synchronising Indicator	4	Voltage Controller	4	Load Current Transformer	4
Definite and Inverse Current Relay	7	Transmission Line Model	8	Resistive Power Controller	4	Synchronoscope	4
Effective Power Controller	8	Bus Bar Feeder Connector	4	Generator Cos $\Phi$ Controller	8	Bus Bar Feeder Connector	6
Power CKT Breaker	14	Capacitive Load	10	Squirrel Cage Motor	4	Switchable Capacitor Battery	4
Resistive Load	10	Bus Bar Feeder Connector	2	Automatic Synchronizer	4	Brake Control Rheostat	2
Three Phase Transformer	8	Loads for Voltage Transformer	4	Peak Digital Tachometer	15	DC Motor	4
Variable Low Voltage Transformer	14	Inductive Load	8	Synchronous Machine	4	Machine Test System	4

Connectors, PCS with all accessories are available

## Control Lab

### Courses Taught:

324EE1: Automatic Control Lab

### Experiment Performed:

MATLAB Basics in Control Systems, State Space Variables, Second Order System Analysis using MATLAB and Cassy Lab, PID Controller, Light Intensity, Temperature, Wind Speed and Water level control using Profi-Cassy, Introduction to PLC, Motor Control using PLC, etc.



### Facilities:

WiFi, Whiteboard, Wireless Multimedia Projector, PCs, Printer, etc

Lab Items	Qty	Lab Items	Qty	Lab Items	Qty
Power Amplifier	14	Summing Network	15	Signal Lamp Three Fold	14
Integral Action Element	15	Venturi Tube	11	Transfer Element	17
Differential Transducer	18	Rofi-Cassy	15	P- Controller	13
Digital Control led	31	Control Board	15	Windmill Aneometer	18
Hand Automatic Switch	14	PLC Basic Unit	14	Reference Generator	12
Light Control System	2	Control Panel	15	Dead Time Element	13
Light Control System-2	13	Ventilator	14	Gain and Offset Adjust	15
PID Digital Controller	13	Frequency Motor	10	Limits Switch	22
Two Position Controller	13	Derivative Element	16	Proximity Switch	10
Temp Controlled System	15	Automatic CKT Breaker	28	Signal Lamp Three Fold	14

## Microprocessor Lab

### Courses Taught:

331EE1: Logic Design Lab

336EE1: Microprocessor and Microcontroller Lab

### Experiment Performed:

Introduction to 8086 microprocessors, Basic operations of MDA 80x86 trainer kit, Different commands of MDA 80x86 trainer Kit, Explore kit mode functionality, Write a program to display the digits in decimal, from 0-7 into 7-segment, Initialize DOT matrix display, A/D convertor application, D/A convertor application, Stepper motor and elevator control applications, The basic concept of 8086 interrupt system.



### Facilities:

WiFi, Whiteboard, Wireless Multimedia Projector, PCs, Printer, etc

Items	Qty.	Items	Qty.
MDA -ASIC	6	PeakTech Digital LCR Meter 2165	15
DSP LAB 2000	15	COMPAQ Laptop	11
Y-0038 Mini Analog Training Kit	20	PeakTech Digital Multimeter 3315 USB	14
Y-0039 Mini Digital Training Kit	30	USB to Parallel Adapter	14
(LD) COM3LAB Kit (proto board)	160	PeakTech Oscilloscope Probe	20



## Communication Lab

### Courses Taught:

342EE1: Communications Lab

### Experiment Performed:

Fourier Series & Fourier Transforms (MATLAB Simulation), AM Modulation, Amplitude Shift-Keying (ASK), AM Demodulation, Phase Shift-Keying (PSK), FM Modulation, FM Demodulation, DSB-SC Modulation, Pulse Amplitude Modulation (PAM), DSB-SC Demodulation, Pulse Code Modulation (PCM), Frequency Shift-Keying (FSK).



### Facilities:

WiFi, Whiteboard, Wireless Multimedia Projector, PCs, Printer, etc.

Lab Items	Qty	Lab Items	Qty	Lab Items	Qty
FM/PM Modulator	15	PCM Demodulator	15	PeakTeck Digital Oscilloscope	15
FM/PM Demodulator	15	TF-Empfanger/CF-Receiver	15	DDS Function Generator	15
PTM De modulator	15	Sensor CASY-2	15	COM-3-LAB-70000	15
PAM Demodulator	15	PCM Demodulator	15	Gun Supply SWR Meter -737021	15
Rotating Antenna	2	CassyLab 2-V1.95	11	DC Power Supply	15
Fiber Optic Receiver	30	PCs along with mouse, keyboard	15	PCM Modulator	15
TF-Sender/CF-Transmitter	15	Monitor-NK570E	15	PTM Modulator	15
TINA Lab kit	1	PeakTech Multimeter	15	PAM Modulator	15
CassyLab V1.66	15	Necessary CDs, Resistors, Diodes, connectors and other accessories are available in adequate numbers			

## Renewable Energy Lab

### Course Taught:

Yet not included in the course; however, graduating projects can be performed in the lab.



### Facilities:

WiFi, Whiteboard, Wireless Multimedia Projector, PCs, Printer, etc.

Lab Items	Qty
Photo Voltaic Cell Kit (along with Power Adapter 2A-1Phase, Power Adapter 2D-3Phase, PC with all Accessories)	4
Fuel Cell Technology Kit (along with Power Adapter 2A-1Phase, Power Adapter 2D-3Phase, PC with all Accessories)	4
Servo Machine Test System (along with Charge control for small wind generator, Analog digital, Multimeter, Lamp Board 12V(DC), Lamp Board 230V(AC), OFF-Grid Inverter 230V/275VA, Load unit 1K Small wind energy generator, Lenze Motor 3-Phase, Quick Chart, PC with all Accessories)	2
Transient Response of AC & DC Kit (along with Power Adapter 2A-1Phase, Power Adapter 2D-3Phase, PC with all Accessories, Digital Multimeter)	1
Flow Control and Process Control by LabView	1
Safety connecting cables, measuring cables, monitor holder, mobile experiment stand and other necessary accessories are available.	

## Computer Programming Lab

### Course Taught:

204GE3: Computer Programming for Engineers  
351EE3: Computer programming for Electrical Engineering

### Experiments Performed:

Introduction of the Lab, Use of IDE Environment to Write, Compile and Run C Programs with input parameters, selection, repetition (for, do/while, etc.), functions with Output Parameters using Pointers, 1-D and 2-D Arrays, Strings, etc., Different Electrical Engineering problems using MATLAB and LabView.



Lab Items	Qty
Dell CPU Core i7 Processor with 4GB RAM	18
Keyboard, Mouse and Monitors	18
<b>Software:</b> Circuit Design Software Suite by NI, Microsoft Office, Microchip, MATLAB 2012 with Simulink Toolboxes, Oracle, Borland/Turbo C++, Labview, Powersim, Powerworld, etc.	

## LIBRARY FACILITIES

The University library (Prince Mesha'al Library) is centrally located within the University campus. Among all of its collections, 80% are in Science and Engineering and 20% in Humanities and Social Sciences. The library has online access through the internet to more than 600 international databases covering humanities, social sciences, sciences and engineering. The resources of the library are summarized in the following table:

Total Number of Books	More than 3 lacs
Number of Electrical Engineering books and Periodicals	21,336
Total Number of Publishers	More than 300
Number of Periodical Titles/ Electronic Journals Subscription	2513
Number of IEEE/IEE standard Journals' Subscription	More than 600
Number of IEEE/IEE Standard Conference Periodicals Subscription	1300
Number of Earlier Issues in Microfilm	37,522 reels

In addition to the online searching and use of international databases, teachers and students can go directly to the central library and take loan of the books for a duration of one academic semester. Besides the central library, there is another departmental library from which only the faculty members can make loans as of their necessity.

## OFFICES AND CLASS ROOMS

The Electrical Engineering Department has 21 offices including the Chairman's Office and the Coordinator's Office. Each faculty member has individual furnished office supported by a desktop, a laptop, full access to intranet and internet, printer and Cisco based intercom system. There is central support for photocopying, scanning and large volume printing facilities also.

NU uses a central scheduling system to assign general purpose classrooms. The system can assign courses in any discipline to any room on campus; however, the system has pre-programmed priorities which result in almost all courses of electrical engineering being assigned to the rooms that are dedicated to the department. The dedicated classrooms for the department are shown in the following table:

Sl.	Room #	Table	Seat	Projector	Wi-Fi	Whiteboard
1.	EE201	30 Chairs with writing board		√	√	√
2.	EE202	6	12	√	√	√
3.	EE203	6	12	√	√	×
4.	EE204-205	6	12	√	√	√
5.	EE206	8	2	√	√	√
6.	EE208	24 Chairs with writing board		√	√	√
7.	EE211	11	20	√	√	√
8.	EE212-214	8	16	√	√	√
9.	EE215	8	16	√	√	×
10.	EE216	5	10	√	√	√
11.	EE217	1	6	√	√	×
12.	EE 218	12	24	√	√	√
13.	EE222	5	10	√	√	×
14.	EE224	5	10	√	√	×
15.	E133: Auditorium	192 Chairs with writing board		√	√	√
16.	E134: Auditorium	192 Chairs with writing board		√	√	√

The rooms in which white boards are not mounted due to the fact of having a column in the place of mounting. The two large Auditoriums, described in the table, are used for meeting, conference and other similar occasions. Sometime the rooms are used for the admission test and other exams with large number of students also. The central air-conditioning system and Wi-Fi coverage of the building makes it suitable for its occupants to spend most their time in performing their jobs appropriately.

## SNAPSHOTS OF LIBRARY AND CLASSROOMS FACILITIES

 A photograph showing rows of dark blue upholstered seats in an auditorium, facing a stage area. A small table with some items is in the foreground.	 A photograph of a classroom showing several rows of light-colored wooden desks with blue chairs. The floor is light-colored and reflective.
<p><b>E134: Auditorium</b></p>	<p><b>EE208: A typical Classroom</b></p>
 A photograph of a library with tall wooden bookshelves filled with books. The floor is light-colored and reflective.	 A photograph of a classroom showing a projector mounted on the ceiling and a large whiteboard on the wall. A black office chair is visible in the foreground.
<p><b>Library</b></p>	<p><b>Classroom Projector and Whiteboard</b></p>

## LAB RESPONSIBILTY

Responsibility	Name	e-mail	Office /Mobile
Lab Co-ordinator	Dr. Mohammad Shahed Akond	<a href="mailto:msakond@nu.edu.sa">msakond@nu.edu.sa</a>	7164
324EE1: Automatic Control Lab	Dr. A. M. Abdel-Hamid	<a href="mailto:ammohammed@nu.edu.sa">ammohammed@nu.edu.sa</a>	7275
	Dr. Akram Ibrahim Elmitwally	<a href="mailto:aielmitwally@nu.edu.sa">aielmitwally@nu.edu.sa</a>	7278
213EE1: Electric Circuits Lab EE1: Renewable Energy Lab	Eng. Fahad Alkahtami	<a href="mailto:fsalkahtani@nu.edu.sa">fsalkahtani@nu.edu.sa</a>	7168
	Dr. Salim Mursal	<a href="mailto:snmursal@nu.edu.sa">snmursal@nu.edu.sa</a>	8626
334EE1: Basic Electronics Lab	Eng. Munir Abu Saq	<a href="mailto:maabusaq@nu.edu.sa">maabusaq@nu.edu.sa</a>	0552458545
	Dr. Saifur Rehman	<a href="mailto:rehman.saifur@gmail.com">rehman.saifur@gmail.com</a>	0596828580
342EE1: Communications Lab	Dr. Abdulkarem H. M. Alkawgani	<a href="mailto:ahalmawgani@nu.edu.sa">ahalmawgani@nu.edu.sa</a>	7186
	Dr. Adam Reda Alhawary	<a href="mailto:aralhawari@nu.edu.sa">aralhawari@nu.edu.sa</a>	8960
325EE1: Electrical Machines Lab	Dr. Ayman Taher Hindi	<a href="mailto:athindi@nu.edu.sa">athindi@nu.edu.sa</a>	8207
331EE1: Logic Design Lab 336EE1: Microprocessor and Microcontroller Lab	Eng. Omar AlShorman	<a href="mailto:oalshorman@nu.edu.sa">oalshorman@nu.edu.sa</a>	7183
	Eng. Essam Abdullah Al-Yafrosi	<a href="mailto:iaalyafrosi@nu.edu.sa">iaalyafrosi@nu.edu.sa</a>	8632
		<a href="mailto:maabusaq@nu.edu.sa">maabusaq@nu.edu.sa</a>	
204GE3: Computer Programming for Engineers 351EE3: Computer programming for Electrical Engineering	Dr. Yousfi Khemissi	<a href="mailto:kayousfi@nu.edu.sa">kayousfi@nu.edu.sa</a>	8625
	Eng. Seif Shebl Seif Seif	<a href="mailto:ssseif@nu.edu.sa">ssseif@nu.edu.sa</a>	8943
Lab Engineer's Manager	Eng. Yusuf AlSayed	<a href="mailto:yusuf@semac.com.sa">yusuf@semac.com.sa</a>	0552073800
Lab Engineer	Eng. Azazul Haque	<a href="mailto:haque.azazul@gmail.com">haque.azazul@gmail.com</a> <a href="mailto:ahhaque@nu.edu.sa">ahhaque@nu.edu.sa</a>	0535363245
	Eng. Anwar Mohammed	<a href="mailto:anwar.alharizy@gmail.com">anwar.alharizy@gmail.com</a>	0560843108
	Amged Ebrahim Ahmed	<a href="mailto:amged126@yahoo.com">amged126@yahoo.com</a>	0535189183