

GEE12002	Electrical and Electronics Technology Lab	L	T	P	C
Version 1.0	Contact Hours -30	0	0	3	2
Pre-requisites/Exposure	Class 12th Level physics				
Co-requisites					

Course Objectives:

- To study basic electronic components
- To observe characteristics of electronic devices
- To study basic electrical circuits
- To comprehend general projection theory, with an emphasis on the use of orthographic projection to represent three-dimensional objects in two-dimensional views.
- To understand the application of industry standards and techniques applied in engineering drawing.
- To apply auxiliary or sectional views to most practically represent engineered parts.
- To Dimension and explain two-dimensional engineering drawings.
- To employ freehand 3D pictorial sketching to aid in the visualization process and to efficiently communicate ideas graphically.
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- eneral projection theory, with an emphasis on the use of orthographic projection to represent three-dimensional objects in two-dimensional views.
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- To employ freehand 3D pictorial sketching to aid in the visualization process and to efficiently communicate ideas graphically.

Course Outcomes:

On completion of this course, the students will be able to:

CO1. Show different meters and instruments for measurement of electronic quantities and understand network theorems.

CO2. Apply the characteristics of different semiconductor devices like diode, BJT, FET etc and carbon tungsten filament lamps experimentally.

CO3. Demonstrate various application circuits using diodes **CO4.** Experiment with the R-L-C circuits

CO5. Illustrate the three phase circuits

On completion of this course, the students will be able to

Identify the principle and significance of engineering drawing along with all the possible geometrical shapes.

Infer the principle and concept of projection of Points, Lines and Planes over Auxiliary Planes.

Demonstrate the principle and concept of Projection of Regular Solids.

Illustrate Sections and Sectional Views of Right Angular Solids and Regular Solids.

Interpret Isometric projection.

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Course Description:

Present technology requires necessary knowledge of ELECTRONICS in most fields. Avionics, Autotronics, Agrotronics, Physics, Process Chemistry, Health Services, etc., already employ components or even whole systems based on Electronics. Thus, there is an increasing number of professionals in these and many other fields who need adequate knowledge and training. Taken this into account, ADAMAS has developed the Basic Electronics and Electricity Integrated Laboratory, capable of covering different levels of difficulty. It is based on a series of self-taught modules, each one referring to a specific area of Electronics.

In this fundamental course, students will be introduced to the basics of engineering drawing. Terms and definitions used in industries, such as manufacturing and construction, may also be covered. Specific skills introduced in this course may include sketching, geometric construction, auxiliary drawing, computing dimensions and lettering. Students will be also introduced to computer-aided drawing (CAD) software or techniques.

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Course Content:

Units	Lecture Hours
List of experiments (Electrical Part): Verification of Thevenin's theorem and Norton's theorem. Verification of Superposition theorem. Verification of Maximum power transfer theorem. Study of R-L-C series circuit. Study of R-L-C parallel circuit. Performance study of fluorescent, LED, tungsten and carbon	

Units	Lecture Hours
lamps. Measurement of power in a three-phase circuit using two-watt meter method. List of experiments (Electronics Part): Familiarization of bread board and electronics elements such as R, L, C, diode, and BJT etc. Familiarization of Function generator and measuring instruments such as CRO and multimeter. Study the V-I characteristic of PN junction diode and find knee voltage. Study the input and output characteristic of bipolar junction transistor (BJT): Common emitter (CE) configuration Study the transfer and drain characteristic of junction field-effect transistor (JFET), hence determine the drain resistance, transconductance factor, amplification factor. Study the transfer and drain characteristic of MOSFET, hence determine the drain resistance, transconductance factor, amplification factor. Realization of digital logic circuit using MOSFET (AND, OR, NOT etc.).	
Module-1: Contact Hr. 9 Introduction to Engineering Drawing covering, Principles of Engineering Graphics and their significance, usage of Drawing instruments, lettering, Conic sections including the Rectangular Hyperbola (General method only); Cycloid, Epicycloid, Hypocycloid and Involute; Scales – Plain, Diagonal and Vernier Scales.	
Module-2: Contact Hr. 9 Orthographic Projections covering, Principles of Orthographic Projections Conventions - Projections of Points and lines inclined to both planes; Projections of planes inclined Planes - Auxiliary Planes.	
Module-3: Contact Hr. 8 Projections of Regular Solids covering, those inclined to both the Planes- Auxiliary Views.	
Module-4: Contact Hr. 9 Sections and Sectional Views of Right Angular Solids covering, Prism, Cylinder, Pyramid, Cone – Auxiliary Views; Development of surfaces of Right Regular Solids - Prism, Pyramid, Cylinder and Cone.	
Module-5: Contact Hr. 10 Isometric Projections covering, Principles of Isometric projection – Isometric Scale, Isometric Views, Conventions; Isometric Views of lines, Planes, Simple and compound Solids; Conversion of Isometric Views to Orthographic Views and Vice-versa, Conventions	
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Units	Lecture Hours
Module-3: Contact Hr. 8 Projections of Regular Solids covering, those inclined to both the Planes- Auxiliary Views.	
Module-4: Contact Hr. 9 Sections and Sectional Views of Right Angular Solids covering, Prism, Cylinder, Pyramid, Cone – Auxiliary Views; Development of surfaces of Right Regular Solids - Prism, Pyramid, Cylinder and Cone.	
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Reference Books:

- Engineering Drawing, N. D. Bhat, Charotar Publishing House (2012).
- Shah, M.B. & B.C. Rana (2008), Engineering Drawing and Computer Graphics, Pearson Education.
- Engineering Drawing & Graphics using Autocad, T. Jeyapoovan, Vikas Publishing House Pvt. Ltd.-Noida; Third edition (2010).
- <https://nptel.ac.in/courses/112103019/>
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Relationship between Course Outcomes (COs) and Program Outcomes (POs):

Course Code	Course Name	COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
GEE12 002	Electric al and Electro nics Technol ogy Lab	CO1200 2.1	3	3	2	1	1	2	1	-	3	-	-	2	1	1	3
GEE12 002	Electric al and Electro nics Technol ogy Lab	CO1200 2.2	3	1	3	1	3	3	3	-	2	-	-	1	2	3	2
GEE12 002	Electric al and Electro	CO1200 2.3	2	2	2	3	2	3	1	-	3	-	-	3	1	2	1

Course Code	Course Name	COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
	nics Technol ogy Lab																
GEE12 002	Electric al and Electro nics Technol ogy Lab	CO1200 2.4	2	1	3	3	3	1	3	-	1	-	-	1	3	3	1
GEE12 002	Electric al and Electro nics Technol ogy Lab	CO1200 2.5	2	3	1	3	2	1	2	-	3	-	-	2	1	3	1
GEE12 002	Electric al and Electro nics Technol ogy Lab	CO1200 2	2. 4	2. 0	2. 2	2. 2	2. 2	2. 0	2. 0	-	2. 4	-	-	1.8	1.6	2.4	1.6
Course Code	Course Name	COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
GEE12 002	Electric al and Electro nics Technol ogy Lab	CO120 02.1	3	2	1	3	1	1	2	-	3	-	-	1	1	3	2
GEE12 002	Electric al and Electro nics Technol ogy Lab	CO120 02.2	3	1	1	2	3	1	2	-	2	-	-	2	1	1	2
GEE12 002	Electric al and Electro nics Technol ogy Lab	CO120 02.3	2	2	1	3	1	1	3	-	3	-	-	3	1	3	3
GEE12 002	Electric al and Electro nics Technol ogy Lab	CO120 02.4	2	2	2	2	2	2	3	-	3	-	-	2	1	1	3
GEE12 002	Electric al and Electro nics	CO120 02.5	2	3	3	3	3	1	2	-	2	-	-	1	2	1	3

Course Code	Course Name	COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
	Technology Lab																
GEE12002	Electrical and Electronics Technology Lab	CO12002.6	2	2	1	1	2	1	2	-	3	-	-	1	1	1	3
GEE12002	Electrical and Electronics Technology Lab	CO12002	2.33	2.0	1.5	2.33	2.0	1.17	2.33	-	2.67	-	-	1.67	1.17	1.67	2.67

Course Code	Course Name	COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
CEE12001	Engineering	CO12001.1	1	2	2	1	2	3	3	-	1	-	-	2	3	2	1
	Drawing & CAD	CO12001.2	1	3	2	1	3	1	2	-	3	-	-	3	2	3	1
		CO12001.3	2	2	2	1	2	3	1	-	3	-	-	3	3	1	2
		CO12001.4	2	2	2	3	2	1	1	-	2	-	-	2	1	2	3
		CO12001.5	3	2	2	2	1	1	3	-	2	-	-	2	2	1	1
		CO12001.6	1.	2.	2.	1.	2.	1.	2.	-	2.	-	-	2.4	2.2	1.8	1.6
		1	8	2	0	6	0	8	0		2						