



Affiliated College

2023 – 2024 onwards



THIRUVALLUVAR UNIVERSITY

(A State University, Accredited with "B+" Grade by NAAC,

Serkadu, Vellore, Tamil Nadu – 632 115

THIRUVALLUVAR UNIVERSITY, VELLORE – 632 115 B.Sc. Electronics Science Curriculum

(For the students admitted during the academic year 2023 – 24 onwards)

Cradita	Title of the Dener	Cualita	Hound	Maximum Marks			
Creans	The of the Paper	Creans	nours	CIA	ESE	Total	
Language-I	Tamil/Other Languages	3	6	25	75	100	
English (CE)-I	Communicative English I	3	6	25	75	100	
Core Theory-I	Basic Electronics	5	5	25	75	100	
Core Practical-1	Basic Electronics Lab	5	5	25	75	100	
Elective-I	Basic Mathematics-I	3	4	25	75	100	
Skill Enhancement Course (SEC - I)	Electronic Communication Systems	2	2	25	75	100	
Foundation Course	Fundamentals Of Electronics	2	2	25	75	100	
	Total	23	30	175	525	700	

FIRST SEMESTER



B.Sc. ELECTRONICS SCIENCE

Paper Code		BASIC ELECTRONICS	L	Т	Р	С	
			5	0	0	5	
Paper type		Core Theory-I		Syllabus		2023-24	
			Ver	rsion 2025-24		-24	

Course Objectives:

The main objectives of this course are to design the amplifiers, feedback amplifiers and power amplifiers.

Exp	Expected Course Outcomes:						
On t	On the successful completion of the course, student will be able to:						
1	Understand the Concept of Network Theorems	K2					
2	Study the basic concepts of AC fundamentals	K2					
3	Understand the basics of P-N junction diode and Zener diode with its applications.	K2					
4	Analyze the working of various configurations of Transistor	K6					
5	5 Outline the concept of feedback amplifiers with parameters involved. K5						
K1 -	Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 - Create						

Unit:1	Unit:1 NETWORK THEOREMS			
Ohm's law - Kirchhoff	's law - node voltage analysis - mesh current method - super p	oosition theorem -		
Thevenin's theorem - Ne	orton's theorem. Thevenin to Norton Conversion- Star and Delta	Conversion.		

Unit:2	AC CIRCUITS	12 hours				
Introduction To Sinuso	idal Wave-RMS Value - Average Value-AC Circuits with Re	esistance- Circuits				
with XL Alone - Circuits with XC Alone - Series Reactance And Resistance - Parallel Reactance and						
Resistance - Series Para	allel Reactance and Resistance - Real Power -Series Resonant	Circuit – Parallel				
Resonant Circuit - Q Fa	ctor.					

Unit:3	DIODE CIRCUITS AND POWER SUPPLIES	12 hours				
PN Junction diode - c	haracteristics - Half and full wave rectifiers - Bridge rectifier	ier - Efficiency -				
ripple factor - Filter circuits - Clipper and Clamper using diodes. Differentiator and integrator						
using resistor and ca	pacitor - Zener Diode - Characteristics - Regulated pow	er supply using				
Zener diode						

Unit:4	TRANSISTOR CIRCUITS & POWER AMPLIFIERS			
Characteristics of a t	ransistor in CB, CE modes - Relatively merits - Graphic	cal analysis in CE		
configuration - Tran	sistor as a amplifier - RC coupled Single stage ampl	ifier - Frequency		
— (D 1 1		

response. Transformer coupled amplifiers - Multistage amplifiers - Emitter follower. Construction of basic logic gates using diodes and transistors.

Class A and Class B power amplifiers - Single ended and push-pull configurations - Power dissipation and output power calculations.

Unit:5	FEEDBACK AMPLIFIERS	12 hours					
Basic concept of feed	Basic concept of feedback amplifiers - Transfer gain with feedback - General characteristics of						
negative feedback am	plifier - Effect of negative feedback on gain - Gain stability	- Distortion and					
bandwidth - Input and	d output resistance in various types of feedback - Analysis	s of voltage and					
current in feedback amplifier circuits.							
	Total Lecture hours	60 hours					

Text	Book(s)
1	Introduction to Integrated Electronics - V. Vijayendran, S.Viswanathan (Printers & Publishers) Pvt. Ltd., Chennai, 2005.
2	Electronic Circuits and Systems - Y.N. Bapat, Tata McGraw Hill Publishing Co. Ltd.

Refe	erence Books
1	Electronic Devices and Circuits - G.K. Mithal, Khanna Publishers, Delhi.
2	Hand Book of Electronics - Gupta & Kumar, Pragati Prakashan, Meerut.
3	Electronic Devices and Circuit Theory - R. Boylestad & L. Nashelsky, Prentice Hall of India Private Limited, 6/e.
4	Electronic Devices and Circuits - J.P. Agarwal & Amit Agarwal, Prakasam Publishers.
5	Linear Integrated Circuits - D. Roy Choudhury & Shail Jain, New Age International (P) Limited.

	Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]						
1	https://www.youtube.com/watch?v=qqiZ2LPkFws						
2	https://www.youtube.com/watch?v=Sr-Sm_d3oVE						
3	https://www.youtube.com/watch?v=LYQ4J94EDdg						
4	https://www.youtube.com/watch?v=8iPRR6iCD8A						
5	https://www.youtube.com/watch?v=qrIOoAIWSaQ						
6	https://nptel.ac.in/courses/108102112						

Mapping with Programme Outcomes										
Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	L	Μ	S	L	М	S	S	S	М	L
CO2	М	S	М	L	L	S	S	М	М	S
CO3	S	L	М	S	М	L	L	S	S	М
CO4	М	S	S	М	L	S	М	S	L	S
CO5	S	L	М	S	M	L	L	S	S	М
*S-Strong; M-Medium; L-Low										

B.Sc. ELECTRONICS SCIENCE

Paper code	BASIC MATHEMATICS - I	L	Т	Р	С
		4	0	0	3
Paper type	Elective - I	Syll Ver	abus sion	202	3-24

Course Objectives:

The main objectives of this course are to develop logical and problem solving skills; becoming familiar with some of the basic techniques used to construct mathematical.

Expected Course Outcomes:		
On the successful completion of the course, student will be able to:		
1 Understand the algebra concepts	K2	
2 Analyze the Theory of Equations and its various operations.	K2	
3 Evaluate the methodology of different matrices.	K5	
4 Understand the different matrices concepts	K2	
5 Understand the trigonometry concepts	K2	
K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create		

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** – Create

ALGEBRA	10 hours			
Partial fractions, Binomial, Exponential, Logarithmic Series [No Proof] Summation Problem.				
THEORY OF EQUATIONS	10 hours			
of equations by increasing, decreasing and multiplying the roots by a	constant, Reciprocal			
MATRICES	10 hours			
Symmetric and Skew symmetric, Orthogonal, Hermitian, Skew	Hermitian, Unitary			
uations, eigen values, Cayley Hamilton's Theorem (Problem Only)				
MATRICES (CONTD)	10 hours			
atrices, Adjoint and inverse of a matrix - Determinant of a matrix,	Solving equations by			
TRIGNOMETRY	10 hours			
n n θ , cos n θ , tan n θ - Expansions of sin ⁿ θ , cos ⁿ θ				
Total Lecture hours	50 hours			
	Binomial, Exponential, Logarithmic Series [No Proof] Summation I THEORY OF EQUATIONS of equations by increasing, decreasing and multiplying the roots by a MATRICES Symmetric and Skew symmetric, Orthogonal, Hermitian, Skew uations , eigen values, Cayley Hamilton's Theorem (Problem Only) MATRICES (CONTD) ATRIGNOMETRY n nθ, cos nθ, tan nθ - Expansions of sin ⁿ θ, cos ⁿ θ Total Lecture hours			

Text	Text Book(s)				
1	P.R.Vittal (2003) Allied Mathematics . Marghan Publications, Chennai				
2	P.Balasubramanian and K.G.Subramanian, (1997) Ancillary Mathematics. Vol. I & II. Tata				
	McGraw Hill, New Delhi.				

Refe	rence Books
1	P.Kandasamy, K.Thilagavathy (2003) Allied Mathematics Vol-I, II S.Chand & company Ltd., New Delhi-55.
2	S.P.Rajagopalan and R.Sattanathan,(2005) Allied Mathematics .Vol. I & II. Vikas Publications, New Delhi.

	Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]
1	https://www.youtube.com/watch?v=it9jv9F8jaA
2	https://www.youtube.com/watch?v=Cp7W8TDjXCQ
3	https://www.youtube.com/watch?v=16LX95gVT_M
4	https://www.youtube.com/watch?v=ZOHMCsdDti0
5	https://www.youtube.com/watch?v=7eHuQXMCOvA
6	https://www.digimat.in/nptel/courses/video/122107036/L01.html

Mappin	g with Pr	ogramme	Outcome	S						
Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	Μ	L	L	М	S	L	М	М	S
CO2	L	М	S	L	М	S	S	S	М	L
CO3	М	S	М	L	L	S	S	М	М	S
CO4	S	L	М	S	М	L	L	S	S	М
CO5	М	М	L	S	М	S	L	L	S	L
*S-Strong; M-Medium; L-Low										

Course Code	ELECTRONIC COMMUNICATION SYSTEMS	L	Т	Р	С	
		2	0	0	2	
Paper type	Skill Enhancement Course (SEC - I)	Syllal Versi	Syllabus Version		2023-24	
Course Objectives:	Course Objectives:					
Fundamentals of anter	Fundamentals of antenna, their characteristics and types					
Amplitude modulation and demodulation and radio wave transmission and reception						
Frequency modulation and demodulation and FM radio wave transmission and reception						
Principle of analog and digital pulse modulation.						

Exp	ected Course Outcomes:	
On the	he successful completion of the course, student will be able to:	
1	Illustrate the construction and working of different types of antennas	К2
2	Explain modulation and discuss the different types modulation	К4
3	Explain the concept and principles of amplitude modulation, frequency and pulse modulation.	К3
K1 -	Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create	

Unit:1	ANTENNA	6 hours			
Antenna – Efficiency	-Directive gain - Bandwidth, Beam width and polarization - D	ipole - Folded			
dipole - Yagi - Uda - Helical - Discone - Parabolic - Dish Antennas					
Unit:2	WAVE PROPAGATION	6 hours			
Ground wave, sky	wave and space wave propagation - skip distance - Max	kimum usable			
frequency.					
Unit:3	AMPLITUDE MODULATION	6 hours			
Modulation - Needs	for Modulation - Types of Modulation - Amplitude Modul	ation - Block			
diagram of AM Radio	o transmitter and super heterodyne Receiver				
Unit:4	FREQUENCY MODULATION	6 hours			
Frequency Modulation transmitter and receive	Frequency Modulation - Definition - Derivation of Modulated wave - Block diagram of FM transmitter and receiver.				
Unit:5	PULSE MODULATION	6 hours			
Pulse Modulation - S	ampling theorem - PAM, PWM, PPM, PCM				
	Total Lecture hours	30 hours			

Text	z Book(s)
1	Electronic Communication Systems - George Kennedy, McGraw Hill Book Company, 4/e, 2005.
2	Communication Engineering - T.G. Palanivelu, Anuradha Publicatons, 1/e, 2002.

Refe	erence Books
1	Communication System - Roddy & Coolen, 4/e, Pearson Education, 2005.
2	Principles of Communication Engineering - Anok Singh, 4/e, Sathyaprakasam Publications, 2004.
3	Electronic Communication Systems Wayne Tomasi, 4/e, Pearson Education, 2004.
4	Antennas by J.D.Kraus

	Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]
1	https://www.youtube.com/watch?v=mHvV_Tv8HDQ
2	https://www.youtube.com/watch?v=6Y9n8dMYL-o
3	https://www.youtube.com/watch?v=90dizh1Sl3E
4	https://www.youtube.com/watch?v=oYRMYSIVj1o
5	https://www.youtube.com/watch?v=fSoXIqBlg9M
6	https://nptel.ac.in/courses/117102059

Mapping with Programme Outcomes											
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	
CO1	S	S	S	М	S	М	М	М	М	S	
CO2	S	L	L	L	L	L	L	S	S	М	
CO3	L	М	S	М	S	S	М	L	L	S	
CO4	М	S	М	S	S	М	S	М	S	S	
CO5	S	L	М	L	М	S	S	S	L	L	
*S-Strong; M-Medium; L-Low											

TRONICS SCIENCE

Paper code	FUNDAMENTALS OF ELECTRONICS	L	Т	Р	С									
D		2	0	0	2									
Paper type	Foundation Course	Sylla Ver	abus sion	202	3-24									
Course Object	ives:													
The main obje	ectives of this course are to:													
Provide an add components	equate knowledge in Basics of electrostatics, electrical me	asurem	ients, e	lectron	ics									
Fynected Cour	·se Autcomes·													
On the success	The course student will be able to:													
1 Understan	the outline and basics of electrostatics.				К2									
2 Understan	the concept of a capacitor and its applications.				K2									
3 Evaluate t	ne electrical measurements and describe magnetic effect of curr	ent			К5									
4 Apply the	electronic components in network theorems.				К2									
5 Understan	the basic of Semiconductors				К3									
K1 - Remembe	r; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate;	K6 – C	Create											
Unit:1	ELECTROSTATICS			7 hours	5									
Electric charge	s - Coulomb's law - Electric field - Electric intensity and	electric	potent	ial - Re	elation									
between electr	ic potential and intensity - Electric intensity and potential	due to	o a uni	form cl	harged									
conducting sph	ere at a point outside, on, and inside the conductor.													
TI '' A	DEGIGTODG			7 1										
Unit:2	KEDIDIORS	and C	annatar	/ nours	S Color									
Coding of Resi	stors - Connecting Resistors in Series and Parallel Testing of R	esistan	ce using	nsues - 9 Multir	Types of Resistors: Fixed, Variable - Brief mention of their Construction and Characteristics - Color									
		constan	ee abing	5 111 101111	neter									
Unit:3														
Unit:3 INDUCTORS 7 hours														
Types of Indu	INDUCTORS ctors: Fixed, Variable- Self and Mutual Inductance-Faraday'	s Law	and Le	7 hours enz's L	neter.									
Types of Indu Electromagneti	INDUCTORS ctors: Fixed, Variable- Self and Mutual Inductance-Faraday' c Induction-Energy Stored In An Inductor-Inductance In Ser	s Law ies And	and Le l Parall	7 hours enz's L el- Test	neter.									
Types of Indu Electromagneti Inductance usir	INDUCTORS ctors: Fixed, Variable- Self and Mutual Inductance-Faraday' c Induction-Energy Stored In An Inductor-Inductance In Ser og Multimeter.	s Law ies And	and Le l Parall	7 hours enz's L el- Test	neter.									
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Tex	Text Book(s)							
1	Electricity and Magnetism - M. Narayanamoorthi and Others, National Publishing Co., chennai							
2	Electricity and Magnetism - R. Murugeshan, S. Chand & Co. Ltd., New Delhi, Revised Edition, 2006.							
3	Principles of Electronics - V.K. Mehta, S. Chand & Co., 4/e, 2001.							
4	Basic Electronics - B.L. Theraja, S. Chand & Co., 4/e, 2001.							
5	Applied Electronics – R.S.Sedha S. Chand & Co., 1/e 1990, Reprint 2018.							

Ref	ference Books
1	Electricity and Magnetism - Brijlal & Subrahmanyam, Ratan Prakashan Mandir, Agra.
2	Fundamentals of Electricity and Magnetism - B.D. Duggal & C.L. Chhabra, Shoban Lal Nagin Chand & Co., Jallundur.
3	Physics, Vol. II - Resnick, Halliday & Krane, 5/e, John Wiley & Sons, Inc.,.
4	Basic Electronics - B. Grob, McGraw - hill, 6/e, NY, 1989.
5	Elements of Electronics - Bagde & Singh, S. Chand & Co.

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]

1	1	https://www.youtube.com/watch?v=OXyR2VaxgYo
4	2	https://www.youtube.com/watch?v=_c9I2-OwKCc
~	3	https://www.youtube.com/watch?v=211aWRuv7XI
4	4	https://youtu.be/UGGaGUPF2fg
4	5	https://www.youtube.com/watch?v=5MLVr9r6Vzk
(6	https://www.digimat.in/nptel/courses/video/108105112/L01.html

Mapping with Programme Outcomes											
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	
CO1	М	L	S	L	L	S	М	L	М	М	
CO2	L	S	М	S	S	М	М	L	L	S	
CO3	S	М	L	L	М	S	L	М	М	S	
CO4	L	М	S	L	М	S	S	S	М	L	
CO5	М	М	S	S	S	L	L	М	М	S	
*S-Strong; M-Medium; L-Low											

B.Sc. ELECTRONICS SCIENCE

Image: Core Practical-I0055Syllabus Version2023-24Course Objectives: The main objectives of this course are to understand the concepts and working of various instruments like Multimeter, CRO, AFO, PN Junction Diode, Zener diode, transistor, construction of power supply, logic gates, wave shaping circuits.K1Expected Course Outcomes:WersionK1Remember the value of resistance by color coding and multimeter.K1K1Remember the value of resistance by color coding and multimeter.K1K1Memember the value of resistance by color coding and multimeter.K1XUnderstand the characteristics of diode and Transistor with its applications.K2Analyze the working CRO.K3A Analyze the function of Wave shaping circuitsK5K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 - CreateVerification of Ohm's Law.Verification of Mirchhoff's LawStudy of Colour Coding of Resistors & Connecting Resistance in Series and Parallel.Verification of Norton's TheoremGVerification of Norton's TheoremPointion idide.ImplementerImplementerVerification of Norton's TheoremPointerin ting PN junction Diode. <td colsp<="" th=""><th>Paper</th><th>· Code</th><th></th><th></th><th>Bas</th><th>ic Electronics</th><th>Lab</th><th>L</th><th>Т</th><th>Р</th><th>С</th></td>	<th>Paper</th> <th>· Code</th> <th></th> <th></th> <th>Bas</th> <th>ic Electronics</th> <th>Lab</th> <th>L</th> <th>Т</th> <th>Р</th> <th>С</th>	Paper	· Code			Bas	ic Electronics	Lab	L	Т	Р	С
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Total Lecture nours 00 nours							Total Lecture b	ours	61) how	rs	
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Text I	Book(s)
1	Electricity and Magnetism - M. Narayanamoorthi & Others, National Publishing Co.,
	Chennai.
2	Electricity and Magnetism - R. Murugeshan, S. Chand & Co. Ltd., New Delhi, Revised
2	Edition, 2006.

Refer	Reference Books								
1	Electricity and Magnetism - Brijlal & Subrahmanyam, Ratan Prakashan Mandir, Agra.								
2	Fundamentals of Electricity and Magnetism - B.D. Duggal & C.L. Chhabra, Shoban Lal								
	Nagin Chand & Co., Jallundur.								
3	Physics, Vol. II - Resnick, Halliday & Krane, 5/e, John Wiley & Sons, Inc.								

	Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]								
1	https://www.youtube.com/watch?v=3h2edx6O6Vc								
2	https://www.youtube.com/watch?v=i6n2yHIBjQw								
3	https://www.youtube.com/watch?v=zjrSAuhTFPE								
4	https://www.youtube.com/watch?v=wvHcm84RsFw								
5	https://www.youtube.com/watch?v=SwI_3BPTr0I								
6	https://nptel.ac.in/courses/122106025								

Mapping with Programme Outcomes											
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	
CO1	S	М	L	S	М	М	L	S	М	L	
CO2	М	S	М	L	L	S	S	М	М	S	
CO3	S	L	М	S	М	L	L	S	S	М	
CO4	L	S	М	S	S	М	М	L	L	S	
CO5	S	М	М	L	S	М	S	S	М	М	
*S-Stron	*S-Strong; M-Medium; L-Low										