GOVERNMENT COLLEGE OF TECHNOLOGY

(An Autonomous Institution Affiliated to Anna University)

Coimbatore - 641 013

Curriculum & Syllabus For

B.E. (ELECTRONICS AND COMMUNICATION ENGINEERING)

(Part Time)

2023

Regulations

OFFICE OF THE CONTROLLER OF EXAMINATIONS

GOVERNMENT COLLEGE OF TECHNOLOGY

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GOVERNMENT COLLEGE OF TECHNOLOGY, COIMBATORE – 641 013
B.E & ELECTRONICS AND COMMUNICATION ENGINEERING (Part Time)

FIRST SEMESTER

Sl. No.	Course Code	Course Title	CA Marks	End Sem Marks	Total Marks	Hours/Week			
						L	T	P	C
THEORY									
1	23PTL1Z1	Applied Mathematics I	40	60	100	3	0	0	3
2	23PTL1Z2	Environmental Science and Engineering	40	60	100	3	0	0	3
3	23PTL103	Electric Circuits and Electron Devices	40	60	100	3	0	0	3
4	23PTL104	C Programming	40	60	100	3	0	0	3
PRACTICAL									
5	23PTL105	C Programming Laboratory	60	40	100	0	0	3	1.5
TOTAL			**230**	**280**	**500**	**12**	**0**	**3**	**13.5**

23PTL1Z1	APPLIED MATHEMATICS -I *(Common to Civil, Mech ,EEE & ECE)*	SEMESTER I

PREREQUISITES	L	T	P	C
NIL	3	0	0	3

Course Objectives	This course mainly deals with topics such as linear algebra, single variable calculus and numerical methods and plays an important role in the understanding of engineering science.	
UNIT – I	**LINEAR ALGEBRA**	**9 Periods**
Consistency of System of Linear Equations, Eigenvalues and eigenvectors, Diagonalization of matrices by orthogonal transformation, Cayley-Hamilton Theorem, Quadratic form to canonical forms.		
UNIT – II	**DIFFERENTIAL CALCULUS**	**9 Periods**
Radius of curvature, Centre of curvature, Circle of curvature , Evolutes of a curve, Envelopes		
UNIT – III	**INTEGRAL CALCULUS**	**9 Periods**
Evaluation of definite and improper integrals, Applications: surface area and volume of revolution (Cartesian coordinates only).		
UNIT – IV	**NUMERICAL SOLUTION OF EQUATIONS**	**9 Periods**
Algebraic and Transcendental equation: Fixed point iteration method, Bisection method, Newton-Raphson method, Simultaneous equation: Gauss elimination method, Gauss-Jordan method, Gauss Seidal method.		
UNIT – V	**NUMERICAL INTERPOLATION**	**9 Periods**
Equal interval: Newton's forward and Backward difference interpolation formulae, Gauss forward and Backward difference interpolation formulae, Unequal interval: Lagrange's interpolation, Newton's divided difference interpolation.		
Contact Periods: **Lecture: 45 Periods Tutorial: 0 Periods Practical: 0 Periods Total: 60 Periods**		

TEXT BOOK

1	*VeerarajanT., "**Engineering Mathematics I"**, Tata McGraw-Hill Education(India)Pvt. Ltd, New Delhi,2015.*
2	*P. Kandasamy, K. Thilagavathy, K. Gunavathi, "**Numerical Methods"**, S. Chand & Company, 3nd Edition, Reprint 2013.*

REFERENCE BOOK

1	*B.S.Grewal, " **Higher Engineering Mathematics", Khanna Publishers, 44th Edition, 2017.*
2	*David C.Lay, **"Linear Algebra and Its Application", PearsonPublishers, 6th Edition,2021.*
3	*Howard Anton, **"Elementry Linear Algebra",** 11^{th} *Edition,WileyPublication, 2013.*
4	*Narayanan.S and Manicavachagom Pillai. T.K. – **CalculasVol I and Vol II,** S.chand& Co, Sixth Edition, 2014.*
5	*S.S. Sastry, "**Introductory methods of numerical analysis", PHI, New Delhi, 5th Edition, 2015. Ward Cheney, David Kincaid, "Numerical Methods and Computin"g,** Cengage Learning**, Delhi, 7th Edition 2013.**
6	*Jain R.K. and Iyengar S.R.K., - **Advanced Engineering Mathematics**, NarosaPublicaitons, Eighth Edition, 2012.*

COURSE OUTCOMES: On completion of the course, the students will be able to:		**Bloom's Taxonomy Mapped**
CO1	Use the essential tool of matrices and linear algebra in a comprehensive manner.	K3
CO2	Explain the fallouts of circle of curvature, evolute and envelops that is fundamental to application of analysis to Engineering problems.	K3
CO3	Interpret the integral calculus to notions of definite and to improper integrals. Apart from some other applications they will have a basic understanding of Beta and Gamma functions.	K3
CO4	Demonstrate understanding of common numerical methods and how they are used to obtain approximate solutions to polynomial and transcendental equations.	K3
CO5	Derive numerical methods for various mathematical operations and tasks, such as interpolation, differentiation, integration, the solution of linear and nonlinear equations.	K3

23PTL1Z2	ENVIRONMENTAL SCIENCE AND ENGINEEREING *(Common to Civil, Mech, , EEE, ECE)*	SEMESTER I

PREREQUISITES	L	T	P	C
NIL	3	0	0	3

Course Objectives	The course is aimed at creating awareness among the students and also inseminates the critical ideas of preserving environment.	
UNIT – I	**ENVIRONMENTAL ENERGY RESOURCES**	**9 Periods**
Food-effects of modern agriculture, fertilizers, pesticides, eutrophication & biomagnifications-Energy resources: renewable resources - Hydro Energy, Solar & Wind. Non-renewable resources – Coal and Petroleum - harnessing methods.		
UNIT – II	**ECO SYSTEM AND BIODIVERSITY**	**9 Periods**
Eco system and its components - biotic and abiotic components. Biodiversity: types and values of biodiversity, hot spots of biodiversity, endangered and endemic species, conservation of biodiversity: In situ and ex situ conservation. Threats to biodiversity-destruction of habitat, habit fragmentation, hunting, over exploitation and man-wildlife conflicts. The IUCN red list categories.		
UNIT – III	**ENVIRONMENTAL POLLUTION**	**9 Periods**
Air pollution, classification of air pollutants – sources, effects and control of gaseous pollutants SO_2, NO_2, H_2S, CO, CO_2 and particulates. Water pollution - classification of water pollutants, organic and inorganic pollutants, sources, effects and control of water pollution. Noise pollution - decibel scale, sources, effects and control.		
UNIT – IV	**ENVIRONMENTAL THREATS**	**9 Periods**
Global warming-measure to check global warming - impacts of enhanced Greenhouse effect, Acid rain-effects and control of acid rain, ozone layer depletion- effects of ozone depletion, disaster management - flood, drought, earthquake and tsunami.		
UNIT – V	**SOCIAL ISSUES AND ENVIRONMENT**	**9 Periods**
Water conservation, rain water harvesting, e-waste management, Pollution Control Act, Wild life Protection Act. Population growth- exponential and logistic growth, variation in population among nations, population policy. Women and Child welfare programs. Role of information technology in human and health, COVID-19 - effects and preventive measures.		
Contact Periods: **Lecture:45 Periods Tutorial: 0 Periods Practical: 0 Periods Total:45 Periods**		

TEXT BOOK:

1	*Sharma J.P., **"Environmental Studies"**, 4th Edition, University Science Press, New Delhi 2016.*
2	*AnubhaKaushik and C.P.Kaushik**, "Environmental Science and Engineering"**, 7th Edition, New age International Publishers, New Delhi, 2021.*

REFERENCES:

1	*A k de,* ***"Environmental Chemistry"****, eight edition, new age international publishers, 2017.*
2	*G. Tyler miller and scott e. Spoolman,* ***"Environmental Science"****, cengage learning indiapvt, ltd, delhi, 2014.*
3	*ErachBharucha,* ***"Textbook of Environmental Studies"****, Universities Press(I) Pvt, Ltd, Hydrabad, 2015.*
4	*Gilbert M.Masters,* ***"Introduction to Environmental Engineering and Science"****, 3rd Edition, Pearson Education, 2015.*

COURSE OUTCOMES: On completion of the course, the students will be able to:		**Bloom's Taxonomy Mapped**
CO1	Recognize and understand about the various environmental energy resources and the effective utility of modern agriculture.	K2
CO2	Acquire knowledge about the interaction of biosphere with environment and conservation methods of bio diversity.	K2
CO3	Be aware of the sources of various types of pollution, their ill effects and preventive methods.	K2
CO4	Identify and take the preventive measures to control the environmental threats and effects of Global warming, Ozone depletion, Acid rain, and natural disasters.	K2
CO5	Demonstrate an idea to save water and other issues like COVID -19.	K2

23PTL103	ELECTRIC CIRCUITS AND ELECTRON DEVICES	SEMESTER I

PREREQUISITES	L	T	P	C
NIL	3	0	0	3

Course Objectives	1. To learn the basic of circuit analysis and transient resonance in RLC circuits. 2. To learn functions and features of semiconductor devices.	
UNIT – I	**CIRCUIT ANALYSIS TECHNIQUES**	**9 Periods**
Kirchoff's current and voltage laws – series and parallel connection of independent sources – R, L and C – Network Theorems – Thevenin, Superposition, Norton, Maximum power transfer and duality – Star-delta conversion.		
UNIT – II	**TRANSIENT RESONANCE IN RLC CIRCUITS**	**9 Periods**
Basic RL, RC and RLC circuits and their responses to pulse and sinusoidal inputs – frequency response – Parallel and series resonances – Q factor – single tuned and double tuned circuits.		
UNIT –III	**SEMICONDUCTOR DIODES**	**9 Periods**
Review of intrinsic & extrinsic semiconductors – Theory of PN junction diode – Energy band structure – current equation – space charge and diffusion capacitances – effect of temperature and breakdown mechanism – Zener diode and its characteristics.		
UNIT –IV	**TRANSISTORS**	**9 Periods**
Principle of operation of PNP and NPN transistors – study of CE, CB and CC configurations and comparison of their characteristics – Breakdown in transistors – operation and comparison of N-Channel and P-Channel JFET – drain current equation – MOSFET – Enhancement and depletion types – structure and operation – comparison of BJT with MOSFET – thermal effect on MOSFET.		
UNIT – V	**SPECIAL SEMICONDUCTOR DEVICES**	**9 Periods**
Tunnel diodes – PIN diode, varactor diode – SCR characteristics and two transistor equivalent model – UJT – Diac and Triac – Laser, CCD, Photodiode, Phototransistor, Photoconductive and Photovoltaic cells – LED, LCD.		
Contact Periods **Lecture: 45 Periods Tutorial: 0 Periods Practical: 0 Periods Total: 45 Periods**		

TEXT BOOK:

1	*Joseph A. Edminister, Mahmood, Nahri, "**Electric Circuits**" – Shaum series,Tata McGraw Hill, (2001).*
2	*S. Salivahanan, N. Suresh kumar and A. Vallavanraj, "**Electronic Devices and Circuits**",Tata McGraw Hill, 2 Edition, (2008)*
3	*David A. Bell, "**Electronic Devices and Circuits**", Oxford University Press, 5 Edition, (2008).*

REFERENCE BOOK :

1	*Robert T. Paynter, "**Introducing Electronics Devices and Circuits**", Pearson Education, (2006).*
2	*William H. Hayt, J.V. Jack, E. Kemmebly and steven M. Durbin, "**Engineering Circuit Analysis**",Tata McGraw Hill, 6 Edition, 2002.*
3	*J. Millman & Halkins, Satyebranta Jit, "**Electronic Devices & Circuits**",Tata McGraw Hill, 2 Edition, 2008.*

COURSE OUTCOMES: On completion of the course, the students will be able to:		**Bloom's Taxonomy Mapped**
CO1	Understand laws, theorems of circuit analysis	K1
CO2	Explain transient resonance in RLC circuits	K2
CO3	Learn Semiconductor diode characteristics	K2
CO4	Learn JFET and MOSFET transistor characteristics	K2
CO5	Understand special semiconductor devices Characteristics	K1

23PTL104	C PROGRAMMING	SEMESTER I

PREREQUISITES	L	T	P	C
NIL	3	0	0	3

Course Objectives	The students will be able to acquire knowledge about the basic concepts of Computer and programming fundamentals, Data types in C and Flow control statements, Functions, Arrays, Pointers and Strings, Bitwise Operators, Preprocessor Directives, Structures and Unions, List Processing, Input and Output.	
UNIT – I	**COMPUTER AND PROGRAMMING FUNDAMENTALS**	**9 Periods**
Computer fundamentals – Evolution, classification, Anatomy of a computer: CPU, Memory, I/O – Introduction to software – Generation and classification of programming languages – Compiling – Linking and loading a program – Translator – loader – linker – develop a program – software Development – Introduction to OS –Types of OS – Algorithms – Structured programming concept.		
UNIT – II	**DATA TYPES AND FLOW OF CONTROL**	**9 Periods**
An overview of C – Programming and Preparation – Program Output – Variables – Expressions, and Assignment, The use of #include, printf(), scanf() – Lexical elements, operators and the C systems – The fundamental data types – Flow of control.		
UNIT – III	**FUNCTIONS, ARRAYS, POINTERS AND STRINGS**	**9 Periods**
Functions and storage classes - 1D Arrays – Pointers – Call by reference – Relationship between Arrays and Pointers – Pointer arithmetic and element size – Arrays as function argument – Dynamic Memory allocation – Strings – String handing functions – Multidimensional Arrays.		
UNIT – IV	**ARRAY OF POINTERS, BITWISE OPERATORS, PREPROCESSOR DIRECTIVES**	**9 Periods**
Arrays of Pointers – Arguments to main () - Ragged Arrays – Functions as Arguments – Arrays of Pointers to Functions - Type qualifiers.-Bitwise operators and expressions – Masks – Software tools – Packing and unpacking – Enumeration types – The preprocessor directives.		
UNIT – V	**STRUCTURES AND UNIONS, I/O AND FILE OPERATIONS**	**9 Periods**
Structures and Unions – Operator precedence and associativity – Bit fields – Accessing bits and bytes - Input and Output functions – File Processing Functions – Environment variables – Use of make and touch.		
Contact Periods: **Lecture: 45 Periods Tutorial: 0 Periods Practical: 0 Periods Total: 45 Periods**		

TEXT BOOK:

1	*Pradip Dey, Manas Ghosh, "**Computer Fundamentals and Programming in C**", Second Edition, Oxford University Press, 2013.*
2	*Al Kelley, Ira Pohl, "**A Book on C-Programming in C**", Fourth Edition, Addison Wesley, 2001.*

REFERENCE BOOK :

1	*Yashavant P. Kanetkar, "**Let Us C**", 14th edition, BPB Publications, 2016.*
2	*Herbert Schildt., "**C: The Complete Reference**", Fourth Edition. McGraw Hill Education, 2017.*
3	*Brian W. Kernighan and Dennis Ritchie, "**The C Programming Language**", Second Edition, Prentice Hall Software Series, 1988.*
4	*E. Balagurusamy, "**Programming in Ansi C**", 6th Edition Tata McGraw-Hill Education, 2012*

COURSE OUTCOMES: On completion of the course, the students will be able to:		**Bloom's Taxonomy Mapped**
CO1	Explain the fundamental of computers programming and Design algorithm for solving the given problem statement.	K3
CO2	Reproduce and explain the operation of various data types and flow control statements	K2
CO3	Design and Compute programs using functions, arrays, pointers and strings	K3
CO4	Illustrate the different right storage classes, preprocessor directives, bitwise operators in programs	K2
CO5	Describe the concept of structures, unions and files in C programming.	K2

23PTL105	C PROGRAMMING LABORATORY	SEMESTER I

PREREQUISITES	L	T	P	C
NIL	0	0	3	1.5

Course Objectives	The students will be able to write program and compile C programming using, Data types and Flow control statements, Functions, Arrays, Pointers and Strings, Dynamic memory allocation and command line arguments, Files, Structures and Unions.

LIST OF EXPERIMENTS:

1	Operators , Expressions and IO formatting
2	Decision Making and Looping
3	Arrays and Strings
4	Functions and Recursion
5	Pointers
6	Dynamic Memory Allocation
7	Structures
8	Unions
9	Files
10	Command line arguments
11	Mini Project

Contact Periods:

Lecture: 0 Periods Tutorial: 0 Periods Practical: 45 Periods Total: 45 Periods

REFERENCES :

1	*Yashavant P. Kanetkar, "**Let Us C**", 14th edition, BPB Publications, 2016.*
2	*Herbert Schildt., "**C: The Complete Reference**", Fourth Edition. McGraw Hill Education, 2017.*
3	*Brian W. Kernighan and Dennis Ritchie, "**The C Programming Language**", Second Edition, Prentice Hall Software Series, 1988.*
4	*E. Balagurusamy, **"Programming in Ansi C",** 6th Edition Tata McGraw-Hill Education, 2012*

COURSE OUTCOMES: On completion of the course, the students will be able to:		**Bloom's Taxonomy Mapped**
CO1	Reproduce and explain the operation of various data types and flow control statements using simple programming.	K2
CO2	Write programs using functions, arrays, pointers and strings.	K3
CO3	Write programs using dynamic memory allocation	K3
CO4	Implement programs using command line arguments, structures, unions, and files	K4
CO5	Develop applications using C.	K5