GOVERNMENT COLLEGE OF TECHNOLOGY, COIMBATORE – 641 013

B.E. ELECTRICAL AND ELECTRONICS ENGINEERING - PART TIME

2023 REGULATIONS

(Candidates admitted during 2022-2023 and onwards)

FIRST SEMESTER

Sl. No.	Course Code	Course Title	Sessional Marks	Final Exam Marks	Total Marks	Credits			
						L	T	P	C
THEORY									
1	23PTE1Z1	Applied Mathematics – I (Common to CIVIL, MECH, EEE & ECE)	40	60	100	3	0	0	3
2	23PTE1Z2	Environmental Science and Engineering (Common to CIVIL, MECH, EEE & ECE)	40	60	100	3	0	0	3
3	23PTE103	Programming in C	40	60	100	3	0	0	3
4	23PTE104	Electric Circuit Theory	40	60	100	3	0	0	3
PRACTICAL									
5	23PTE105	Programming in C Laboratory	60	40	100	0	0	3	1.5
		TOTAL			500				13.5

23PTE1Z1	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**
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**
Radius of curvature, Centre of curvature, Circle of curvature , Evolutes of a curve, Envelopes		
UNIT – III	**INTEGRAL CALCULUS**	**9**
Evaluation of definite and improper integrals, Applications: surface area and volume of revolution (Cartesian coordinates only).		
UNIT – IV	**NUMERICAL SOLUTION OF EQUATIONS**	**9**
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**
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.*

REFERENCES

1	*B.S.Grewal,* ***"Higher Engineering Mathematics"****, Khanna Publishers, 44th Edition, 2017.*
2	*David C.Lay,* ***"Linear Algebra and Its Application"****, Pearson Publishers, 6th Edition,2021.*
3	*Howard Anton,* ***"Elementry Linear Algebra"****, 11th Edition, Wiley Publication, 2013.*
4	*Narayanan.S and Manicavachagom Pillai. T.K. –* ***"Calculas Vol 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.*
6	*Ward Cheney, David Kincaid,* ***"Numerical Methods and Computing",*** *Cengage Learning, Delhi, 7th Edition 2013.*
7	*Jain R.K. and Iyengar S.R.K.,* ***"Advanced Engineering Mathematics"****, Narosa Publicaitons, Eighth Edition, 2012.*

	COURSE OUTCOMES: Upon 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

COURSE ARTICULATION MATRIX

a) CO and PO Mapping

COs/POs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO1	3	3	2	2	-	-	-	-	-	-	-	2	-	1
CO2	3	3	2	2	-	-	-	-	-	-	-	2	-	1
CO3	3	3	2	2	-	-	-	-	-	-	-	2	-	1
CO4	3	3	2	2	-	-	-	-	-	-	-	2	-	1
CO5	3	3	2	2	-	-	-	-	-	-	-	2	-	1
23PTE1Z1	3	3	2	2	-	-	-	-	-	-	-	2	-	1

1– Slight, 2 – Moderate, 3 – Substantial

23PTE1Z2	ENVIRONMENTAL SCIENCE AND ENGINEERING (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**
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**
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**
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**
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**
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: Upon 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

Course Articulation Matrix															
COs/POs	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PSO 1**	**PSO 2**	**PSO 3**
CO1	1	1	-	-	-	-	1	-	-	-	-	-	1	-	-
CO2	1	1	-	-	-	-	1	-	-	-	-	-	1	-	-
CO3	2	1	-	-	-	-	1	-	-	-	-	-	1	-	-
CO4	2	2	1	-	-	-	1	-	-	-	-	-	1	-	-
CO5	2	2	1	-	-	-	1	-	-	-	-	-	1	-	-
23PTE1Z2	**2**	**2**	**1**	-	-	-	**1**	-	-	-	-	-	**1**	-	-
1 – Slight, 2 – Moderate, 3 – Substantial															

23PTE103	PROGRAMMING IN C	SEMESTER I

PREREQUISITES	L	T	P	C
NIL	3	0	0	3

Course Objectives	1. To Familiarize with Computer and Programming fundamentals 2. To understand Data types in C and Flow control statements 3. To outline Functions, Arrays, Pointers and Strings 4. To recognize Bitwise Operators, Pre-processor Directives, Structures and Unions 5. To build Structures, Unions, List Processing, Input and Output functions.	
UNIT – I	**COMPUTER AND PROGRAMMING FUNDAMENTALS**	**9**
Computer fundamentals –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**
An overview of C – Programming and Preparation – Program Input /Output – Variables – Expressions, and Assignment, The use of #include, printf(), scanf() – Lexical elements, operators - The fundamental data types – Flow of control		
UNIT – III	**FUNCTIONS, ARRAYS, POINTERS AND STRINGS**	**9**
Functions and storage classes - 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**
Arrays of Pointers – Arguments to main () - Functions as Arguments – Array 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**
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	*PradipDey, ManasGhosh, "**Computer Fundamentals and Programming in C**", Second Edition, Oxford University Press, 2013.*
2	*Ashok H. Kamthane, Amit Ashok Kamthane, "**Programming in C**", Third Edition, Pearson, 2015.*

REFERENCES:

1	*Stephen G. Kochan, "**Programming in C-A complete introduction to the C programminglanguage**", Third Edition, Sams Publication, 2004.*
2	*Yashavant P. Kanetkar, "**Let Us C**", 13th edition, BPB Publications, 2013.*
3	*Brian W. Kernighan and Dennis Ritchie, "**The C Programming Language**", Second Edition, Prentice Hall Software Series, 1988.*
4	*Stephen Prata, "**C Primer Plus**", Fifth Edition, Sams Publishing, 2005.*

COURSE OUTCOMES: On completion of the course, the students will be able to:		**Bloom's Taxonomy Mapped**
CO1	Articulate the programming environment	K1
CO2	Write algorithm for solving the given problem statement	K2
CO3	Use right data types and flow control statements	K1
CO4	Write programs using functions, arrays, pointers and strings	K1
CO5	Use right storage classes, preprocessor directives, bitwise operators in programs	K3

COURSE ARTICULATION MATRIX:

a) CO and PO Mapping															
COs/ POs	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PSO 1**	**PSO 2**	**PSO 3**
CO1	3	3	1	3	-	-	-	-	-	-	-	-	2	1	1
CO2	3	3	1	3	-	-	-	-	-	-	-	-	3	3	1
CO3	3	3	1	3	-	-	-	-	-	-	-	-	3	3	1
CO4	3	3	1	3	-	-	-	-	-	-	-	-	3	2	2
CO5	3	3	1	3	-	-	-	-	-	-	-	-	2	2	2
23PTE 103	3	3	1	3	-	-	-	-	-	-	-	-	3	2	1
1 – Slight, 2 – Moderate, 3 – Substantial															

23PTE104	ELECTRIC CIRCUIT THEORY	SEMESTER I

PREREQUISITES	L	T	P	C
NIL	3	0	0	3

Course Objectives	To gain knowledge in basic concepts of circuit theory and finally be able to analyze and synthesize electric circuits	
UNIT – I	**DC AND AC CIRCUIT ANALYSIS**	**9**
Ohm's law and Kirchhoff's Laws –Form Factor and Peak Factor derivation for alternating waveforms - R, L, C series-parallel circuits - Star-delta transformation - Source transformations - Mesh and nodal methods –Power factor - Real, reactive and apparent powers.		
UNIT – II	**NETWORK THEOREMS AND POLYPHASE CIRCUITS**	**9**
Superposition theorem – Thevenin's and Norton's theorems - Maximum power transfer theorem - Reciprocity theorem. Three phase system - Interconnection of three- phase sources and loads - Balanced and unbalanced circuits - Power measurement.		
UNIT – III	**RESONANCE, COUPLED CIRCUITS AND TRANSIENTS**	**9**
Resonance in series and parallel circuits – frequency response - derivation of bandwidth - Introduction to coupled circuits – Mutual inductance – Coefficient of coupling - Dot rule - Single and double tuned circuits - Problems. Transient responseusing Laplace transforms – DC response of RL, RC, R L C circuits – Sinusoidal response of RL, RC, RLC circuits.		
UNIT – IV	**TWO PORT NETWORKS**	**9**
Two port networks - Open circuit impedance and short circuit admittance parameters – Transmission and inverse transmission parameters – Hybrid and inverse hybrid parameters- Image parameters - Application.		
UNIT – V	**FILTER DESIGN AND SYNTHESIS OF CIRCUITS**	**9**
Classification of filters - Low pass and high pass filters - Band pass and Band stop filters- Constant K and m-derived filters. Hurwitz Polynomials – Positive Real Function – Synthesis of reactive one port RL, RC networks using Foster and Cauer methods.		
Contact Periods: **Lecture: 45 Periods Tutorial: 0 Periods Practical: 0 Periods Total: 45 Periods**		

TEXT BOOK:

1	*Sudakar A. and Shyam Mohan S.Palli **"Circuits and Networks (Analysis and Synthesis)"** Tata McGraw Hill Book Co., New Delhi, III Ed., 2017.*
2	*Charles K. Alexander, Matthew N.O. Sadiku **"Fundamentals of Electric Circuits"** McGraw Hill Book Co., 7 Ed. 2020.*

REFERENCES:

1	*Hayt W.H and Kemmerley J.E, **"Engineering Circuit Analysis"**, Tata McGraw Hill Book Co., V Ed., 2019.*
2	*C.P. Kuriakose **"Circuit Theory: Continuous and Discrete – time systems – Elements of Network Synthesis"** PHI, Delhi, 2018.*
3	*Gangadhar K.A., **"Circuit Theory"**, Khanna Publishers, II Ed., 2019.*
4	*M.E.VanValkenburg, **"Network Analysis"**, PHI, Delhi, 2019.*

COURSE OUTCOMES: On completion of the course, the students will be able to:		**Bloom's Taxonomy Mapped**
CO1	Apply electric circuit laws to DC and AC circuits and solve problems	K3
CO2	Analyze complex circuits using theorems and solve three phase circuits	K4
CO3	Understand the concepts of resonance, coupled circuits and transients and solve problems	K2
CO4	understand two port networks and solve the networks using different parameters	K2
CO5	Design filter circuits and Synthesize electric networks.	K6

COURSE ARTICULATION MATRIX :

a) CO and PO Mapping															
COs/ POs	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PSO 1**	**PSO 2**	**PSO 3**
CO1	3	3	1	3	-	-	-	-	-	-	-	-	2	1	1
CO2	3	3	1	3	-	-	-	-	-	-	-	-	3	3	1
CO3	3	3	1	3	-	-	-	-	-	-	-	-	3	3	1
CO4	3	3	1	3	-	-	-	-	-	-	-	-	3	2	2
CO5	3	3	1	3	-	-	-	-	-	-	-	-	2	2	2
23PTE104	3	3	1	3	-	-	-	-	-	-	-	-	3	2	1
1 – Slight, 2 – Moderate, 3 – Substantial															

23PTE105	PROGRAMMING IN C LABORATORY	SEMESTER I

PREREQUISITES	L	T	P	C
NIL	3	0	0	3

Course Objectives	Upon completion of this course, the Students will be familiar with 1.Data types in C and Flow control statements 2. Functions, Arrays, Pointers And Strings 3. Dynamic memory allocation and command line arguments 4.Bitwise Operators, Preprocessor Directives, Structures and Unions 5. Structures, List Processing, Input and Output.

PRACTICALS EXERCISES ILLUSTRATING THE FOLLOWING CONCEPTS:

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

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

COURSE OUTCOMES: On completion of the course, the students will be able to:		**Bloom's Taxonomy Mapped**
CO1	Use appropriate data types and flow control statements	K1
CO2	Write programs using functions, arrays, pointers and strings	K3
CO3	Write programs using dynamic memory allocation	K3
CO4	Implement programs using right storage classes, preprocessor directives, bitwise operators	K2
CO5	Work with command line arguments, structures, unions and files	K3

COURSE ARTICULATION MATRIX :

a) CO and PO Mapping															
COs/POs	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PSO 1**	**PSO 2**	**PSO 3**
CO1	3	3	1	3	-	-	-	-	-	-	-	-	2	1	1
CO2	3	3	1	3	-	-	-	-	-	-	-	-	3	3	1
CO3	3	3	1	3	-	-	-	-	-	-	-	-	3	3	1
CO4	3	3	1	3	-	-	-	-	-	-	-	-	3	2	2
CO5	3	3	1	3	-	-	-	-	-	-	-	-	2	2	2
23PTE 105	3	3	1	3	-	-	-	-	-	-	-	-	3	2	1
1 – Slight, 2 – Moderate, 3 – Substantial															