DGCT AUTONOMOUS REGULATIONS – 2024

II SEMESTER

24MEN201	PROFESSIONAL ENGLISH – II	L	T	P	C
		2	0	2	3

OBJECTIVES:

- To engage learners in meaningful language activities to improve their reading and writing skills
- To learn various reading strategies and apply in comprehending documents in professional context.
- To help learners understand the purpose, audience, contexts of different types of writing
- To develop analytical thinking skills for problem solving in communicative contexts
- To demonstrate an understanding of job applications and interviews for internship and placements

UNIT - I MAKING COMPARISONS 12

Reading - Reading advertisements, user manuals, brochures;
Writing - Professional emails, Email etiquette - Compare and Contrast
Grammar - Mixed Tenses, Prepositional phrases
Speaking - Role Play Exercises Based on Workplace Contexts, - talking about competition-discussing progress toward goals-talking about experiences- talking about events in life-discussing past events

UNIT - II EXPRESSING CAUSAL RELATIONS IN SPEAKING AND WRITING 12

Reading - Reading longer technical texts– Cause and Effect Essays, and Letters / emails of complaint
Writing - Writing responses to complaints
Grammar – Active Passive Voice transformations, Infinitive and Gerunds
Speaking - discussing news stories-talking about frequency-talking about travel problems-discussing travel procedures- talking about travel problems- making arrangements-describing arrangements discussing plans and decisions- discussing purposes and reasons-understanding common technology terms

UNIT - III DESCRIPTION OF A PROCESS / PRODUCT 12

Reading – Case Studies, excerpts from literary texts, news reports etc
Writing - Letter to the Editor, Checklists, Problem solution essay / Argumentative Essay
Grammar - Error correction; If conditional sentences
Speaking - discussing predictions-describing the climate-discussing forecasts and scenarios- talking
about purchasing-discussing advantages and disadvantages- making comparisons-discussing likes and dislikes- discussing feelings about experiences-discussing imaginary scenarios

Unit - IV REPORTING OF EVENTS AND RESEARCH 12

Reading – Newspaper articles
Writing – Recommendations, Transcoding, Accident Report, Survey Report
Grammar – Reported Speech, Modals Vocabulary – Conjunctions- use of prepositions
Speaking - discussing the natural environment-describing systems-describing position and movement explaining rules-(example- discussing rental arrangements)- understanding technical instructions

CHAIRMAN
Board of Studies
Department of Robotics and Automation
Dhirajlal Gandhi College of Technology
Salkanampatty, Salem - 636 309.

UNIT - V THE ABILITY TO PUT IDEAS OR INFORMATION COGENTLY 12

Reading – Company profiles, Statement of Purpose, (SOP), an excerpt of interview with professionals

Writing – Job / Internship application – Cover letter & Resume

Grammar – Numerical adjectives, Relative Clauses.

Speaking - describing things relatively-describing clothing-discussing safety issues (making recommendations) talking about electrical devices-describing controlling actions

TOTAL PERIODS : 60

COURSE OUTCOMES: At the end of the course, learners will be able

CO1 - To compare and contrast products and ideas in technical texts.

CO2 - To identify and report cause and effects in events, industrial processes through technical texts

CO3 - To analyse problems in order to arrive at feasible solutions and communicate them in the written format.

CO4 - To present their ideas and opinions in a planned and logical manner

CO5 - To draft effective resumes in the context of job search.

TEXT BOOKS:

1. English for Engineers & Technologists Orient Blackswan Private Ltd. Department of English, Anna University, (2020 edition) English for Science & Technology Cambridge University Press, 2021.
2. Authored by Dr. VeenaSelvam, Dr. SujathaPriyadarshini, Dr. Deepa Mary Francis, Dr. KN. Shoba, and Dr. Lourdes Joevani, Department of English, Anna University.

REFERENCE BOOKS:

1. Raman. Meenakshi, Sharma. Sangeeta (2019). Professional English. Oxford university press Delhi.
2. Improve Your Writing ed. V.N. Arora and Laxmi Chandra, Oxford Univ. Press, 2001, NewDelhi.
3. Learning to Communicate – Dr. V. Chellammal. Allied Publishers, New Delhi, 2003
4. Business Correspondence and Report Writing by Prof. R.C. Sharma & Krishna Mohan, Tata McGraw Hill & Co. Ltd., 2001, New Delhi.
5. Developing Communication Skills by Krishna Mohan, MeeraBannerji-Macmillan India Ltd. 1990, Delhi.
6. Raman. Meenakshi, Sharma. Sangeeta (2019). Professional English. Oxford university press Delhi.

CO's, PO's & PSO's MAPPING

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	PSO 1	PSO 2	PSO 3
CO1	3	3	3	3	3	3	3	3	2	3	3	3	-	-	-
CO2	3	3	3	3	3	3	3	3	2	3	3	3	-	-	-
CO3	3	3	3	3	3	3	3	3	2	3	3	3	-	-	-
CO4	3	3	3	3	2	3	3	3	2	3	3	3	-	-	-
CO5	-	-	-	-	-	-	-	-	3	3	3	3	-	-	-
Avg.	3	3	3	3	2.7	3	3	3	2.2	3	3	3	-	-	-

1- Low, 2- Medium, 3- High, "-" No Correlation

CHAIRMAN
Board of Studies
Department of Robotics and Automation
Dhirajlal Gandhi College of Technology

DGCT AUTONOMOUS REGULATIONS – 2024

II SEMESTER

24TMA202	DIFFERENTIAL EQUATIONS AND COMPLEX ANALYSIS	L	T	P	C
		3	1	0	4

OBJECTIVES:

- To acquaint the students with Differential Equations which are significantly used in engineering problems.
- To make the student appreciate the purpose of using transforms to create a new domain in which it is easier to handle the problem that is being investigated.
- To develop an understanding of the standard techniques of complex variable theory in particular analytic function and its mapping property.
- To familiarize the students with complex integration techniques and contour integration techniques which can be used in real integrals.
- To acquaint the student with the concepts of vector calculus needed for problems in all engineering disciplines.

UNIT - I ORDINARY DIFFERENTIAL EQUATIONS **9+3**

Higher order linear differential equations with constant coefficients – Method of variation of parameters – Cauchy's and Legendre's linear equations – Simultaneous first order linear equations with constant coefficients.

UNIT - II LAPLACE TRANSFORM **9+3**

Laplace transform – Sufficient condition for existence – Transform of elementary functions – Basic properties – Transform of periodic functions. Inverse Laplace transform -Statement of Convolution theorem – Initial and final value theorems – Solution of linear ODE of second order with constant coefficients using Laplace transformation techniques.

UNIT - III ANALYTIC FUNCTIONS **9+3**

Functions of a complex variable – Analytic functions: Necessary conditions – Cauchy-Riemann equations and sufficient conditions (excluding proofs) – Harmonic conjugate – Construction of analytic functions – Conformal mapping: w = z+k, kz, $\frac{1}{z}$ and bilinear transformation.

UNIT - IV COMPLEX INTEGRATION **9+3**

Complex integration – Statement and applications of Cauchy's integral theorem and Cauchy's integral formula – Taylor's and Laurent's series expansions – Singular points – Residues – Cauchy's residue theorem – Evaluation of real definite integrals as contour integrals around unit circle and semi-circle (excluding poles on the real axis).

UNIT - V VECTOR CALULUS **9+3**

Gradient, Divergence and Curl -directional derivative- line, surface and volume integrals - Statement of Green's, Stoke's and Gauss divergence theorems -verification and evaluation of vector integrals using them.

TOTAL PERIODS : 60

CHAIRMAN
Board of Studies
Department of Robotics and Automation
Dhirajlal Gandhi College of Technology
Sikkanampatty, Salem - 636 309.

COURSE OUTCOMES: At the end of the course, learners will be able to

CO1 - To acquaint the students with Differential Equations which are significantly used in engineering problems.

CO2 - Able to solve problems related to engineering applications by using Laplace transforms.

CO3 - To develop an understanding of the standard techniques of complex variable theory in particular analytic function and its mapping property.

CO4 - To familiarize the students with complex integration techniques and contour integration techniques which can be used in real integrals.

CO5 - To develop the fundamentals and basic concepts in vector calculus

TEXT BOOKS:

1. Bali N. P and Manish Goyal, "A Text book of Engineering Mathematics", Eighth Edition, Laxmi Publications Pvt Ltd.,2011.
2. Grewal. B.S, "Higher Engineering Mathematics", 41st Edition, Khanna Publications, Delhi, 2011.

REFERENCE BOOKS:

1. Dass, H.K., and Er. RajnishVerma,"Higher Engineering Mathematics", S. Chand Private Ltd., 2011
2. Glyn James, "Advanced Modern Engineering Mathematics", 3rd Edition, Pearson Education,2012.
3. Peter V. O'Neil," Advanced Engineering Mathematics", 7th Edition, Cengage learning, 2012.
4. Ramana B.V, "Higher Engineering Mathematics", Tata McGraw Hill Publishing Company, New Delhi, 2008.
5. Sivarama Krishna Das P. and Rukmangadachari E., "Engineering Mathematics" Volume II, Second Edition, PEARSON Publishing, 2011.

CO's, PO's & PSO's MAPPING

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	PSO 1	PSO 2	PSO 3
CO1	3	3	1	1	1	-	-	-	2	-	2	3	-	-	-
CO2	3	3	1	1	1	-	-	-	2	-	2	3	-	-	-
CO3	3	3	1	1	1	-	-	-	2	-	2	3	-	-	-
CO4	3	3	1	1	1	-	-	-	2	-	2	3	-	-	-
CO5	3	3	1	1	1	-	-	-	2	-	2	3	-	-	-
Avg.	3	3	1	1	1	-	-	-	2	-	2	3	-	-	-

1- Low, 2- Medium, 3- High, "-" No Correlation

CHAIRMAN
Board of Studies
Department of Robotics and Automation
Dhirajlal Gandhi College of Technology
Sikkanampatty, Salem - 636 309.

DGCT AUTONOMOUS REGULATIONS – 2024

II SEMESTER

24TPH202	MATERIALS SCIENCE	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To make the students to understand the basics of crystallography and its importance in studying materials properties.
- To understand the electrical properties of materials including free electron theory, applications of quantum mechanics and magnetic materials.
- To instill knowledge on physics of semiconductors, determination of charge carriers and device applications.
- To establish a sound grasp of knowledge on different optical properties of materials, optical displays and applications
- To inculcate an idea of significance of nano structures, quantum confinement and ensuing nano device applications.

UNIT - I INTRODUCTION TO ENGINEERING MATERIALS 9

Crystal structures: BCC, FCC and HCP – directions and planes - linear and planar densities – crystal imperfections- edge and screw dislocations – grain and twin boundaries - Burgers vector and elastic strain energy- Slip systems, plastic deformation of materials - Polymorphism – phase changes – nucleation and growth – homogeneous and heterogeneous nucleation-Ferrous-Non-Ferrous metals-Types-Microstructure-Characteristics-Non-Metallic materials-Polymers-Types-Ceramic and Composite materials.

UNIT - II ELECTRICAL AND MAGNETIC PROPERTIES OF MATERIALS 9

Classical free electron theory - Expression for electrical conductivity – Thermal conductivity, expression - Quantum free electron theory :Tunneling – degenerate states – Fermi- Dirac statistics – Density of energy states – Electron in periodic potential – Energy bands in solids – tight binding approximation - Electron effective mass – concept of hole. Magnetic materials: Dia, para and ferromagnetic effects – paramagnetism in the conduction electrons in metals – exchange interaction and ferromagnetism – quantum interference devices – GMR devices.

UNIT - III SEMICONDUCTORS AND TRANSPORT PHYSICS 9

Intrinsic Semiconductors – Energy band diagram – direct and indirect band gap semiconductors – Carrier concentration in intrinsic semiconductors – extrinsic semiconductors - Carrier concentration in N-type & P-type semiconductors – Variation of carrier concentration with temperature – Carrier transport in Semiconductors: Drift, mobility and diffusion – Hall effect and devices – Ohmic contacts – Schottky diode.

UNIT - IV OPTICAL PROPERTIES OF MATERIALS 9

Classification of optical materials – Optical processes in semiconductors: optical absorption and emission, charge injection and recombination, optical absorption, loss and gain. Optical processes in quantum wells – Optoelectronic devices: light detectors and solar cells – light emitting diode – laser diode - optical processes in organic semiconductor devices –excitonic state – Electro-optics and nonlinear optics: Modulators and switching devices – plasmonics.

UNIT - V NANOELECTRONIC DEVICES 9

Quantum confinement – Quantum structures – quantum wells, wires and dots – Zener-Bloch oscillations – Resonant tunneling – quantum interference effects - mesoscopic structures - Single electron phenomena – Single electron Transistor. Semiconductor photonic structures – 1D, 2D and 3D photonic crystal. Active and passive optoelectronic devices – photo

CHAIRMAN
Board of Studies
Department of Robotics and Automation
Dhirajlal Gandhi College of Technology
Sikkanampatty, Salem - 636 309.

processes – spintronics – carbon nanotubes: Properties and applications.

TOTAL PERIODS : 45

COURSE OUTCOMES: At the end of the course, learners will be able to

CO1 - Know basics of crystallography and its importance for varied materials properties

CO2 - Gain knowledge on the electrical and magnetic properties of materials and their applications

CO3 - Understand clearly of semiconductor physics and functioning of semiconductor devices

CO4 - Understand the optical properties of materials and working principles of various optical devices

CO5 - Appreciate the importance of functional nanoelectronic devices.

TEXT BOOKS:

1. Know basics of crystallography and its importance for varied materials properties
2. Gain knowledge on the electrical and magnetic properties of materials and their applications
3. Understand clearly of semiconductor physics and functioning of semiconductor devices
4. Understand the optical properties of materials and working principles of various optical devices
5. Appreciate the importance of functional nanoelectronic devices.

REFERENCE BOOKS:

1. R.Balasubramaniam, Callister's Materials Science and Engineering. Wiley (Indian Edition), 2014.
2. Wendelin Wright and Donald Askeland, Essentials of Materials Science and Engineering, CL Engineering, 2013.
3. Robert F.Pierret, Semiconductor Device Fundamentals, Pearson, 2006
4. Pallab Bhattacharya, Semiconductor Optoelectronic Devices, Pearson, 2017
5. Ben Rogers, Jesse Adams and SumitaPennathur, Nanotechnology: Understanding Small Systems, CRC Press, 2017.

CO's, PO's & PSO's MAPPING

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	PSO 1	PSO 2	PS0 3
CO1	3	2	1	2	1	1	-	-	-	-	-	-	-	-	-
CO2	3	2	1	1	2	1	1	-	-	-	-	-	-	-	-
CO3	3	2	2	2	2	1	-	-	-	-	-	-	-	-	-
CO4	3	2	2	1	2	2	-	-	-	-	-	1	-	-	-
CO5	3	2	2	1	2	1	-	-	-	-	-	-	-	-	-
Avg.	3	2	1.6	1.4	1.8	1.2	1	-	-	-	-	1	-	-	-

1- Low, 2- Medium, 3- High, "-" No Correlation

CHAIRMAN
Board of Studies
Department of Robotics and Automation
Dhirajlal Gandhi College of Technology
Sikkanampatty, Salem - 636 309.

DGCT AUTONOMOUS REGULATIONS – 2024

II SEMESTER

		L	T	P	C
24TME201	**ENGINEERING GRAPHICS**	**2**	**0**	**2**	**3**

COURSE OBJECTIVES:

1. Drawing engineering curves.
2. Drawing freehand sketch of simple objects.
3. Drawing freehand sketch of simple objects.
4. Drawing development of solids
5. Drawing isometric and perspective projections of simple solids.

CONCEPTS AND CONVENTIONS (Not for Examination)

Importance of graphics in engineering applications - Use of drafting instruments - BIS conventions and specifications - Size, layout and folding of drawing sheets - Lettering and dimensioning.

UNIT - I PLANE CURVES **12**

Basic Geometrical constructions, Curves used in engineering practices: Conics - Construction of ellipse, parabola and hyperbola by eccentricity method - Construction of cycloid - construction of involutes of square and circle - Drawing of tangents and normal to the above curves.

UNIT - II PROJECTION OF POINTS, LINES AND PLANE SURFACE **12**

Orthographic projection- principles-Principal planes-First angle projection-projection of points. Projection of straight lines (only First angle projections) inclined to both the principal planes - Determination of true lengths and true inclinations by rotating line method and traces. Projection of planes (polygonal and circular surfaces) inclined to both the principal planes by rotating object method.

UNIT - III PROJECTION OF SOLIDS AND FREEHAND SKETCHING **12**

Projection of simple solids like prisms, pyramids, cylinder, cone and truncated solids when the axis is inclined to one of the principal planes and parallel to the other by rotating object method. Visualization concepts and Free Hand sketching: Visualization principles - Representation of Three Dimensional objects - Layout of views- Freehand sketching of multiple views from pictorial views of objects. Practicing three dimensional modeling of simple objects by CAD Software (Not for examination)

UNIT - IV PROJECTION OF SECTIONED SOLIDS AND DEVELOPMENT OF SURFACES **12**

Sectioning of above solids in simple vertical position when the cutting plane is inclined to the one of the principal planes and perpendicular to the other - obtaining true shape of section. Development of lateral surfaces of simple and sectioned solids - Prisms, pyramids cylinders and cones.

Practicing three dimensional modeling of simple objects by CAD Software (Not for examination)

CHAIRMAN
Board of Studies
Department of Robotics and Automation
Dhirajlal Gandhi College of Technology
Sikkanampatty, Salem - 636 309.

UNIT - V ISOMETRIC AND PERSPECTIVE PROJECTIONS 12

Principles of isometric projection — isometric scale - lsometric projections of simple solids and truncated solids - Prisms, pyramids, cylinders, cones- combination of two solid objects in simple vertical positions - Perspective projection of simple solids-Prisms, pyramids and cylinders by visual ray method. Practicing three dimensional modeling of isometric projection of simple objects by CAD Software (Not for examination)

TOTAL PERIODS: 60

COURSE OUTCOMES:

On successful completion of this course, the student will be able to

CO1: Use BIS conventions and specifications for engineering drawing.
CO2: Construct the conic curves, involutes and cycloid.
CO3: Solve practical problems involving projection of lines.
CO4: Draw the orthographic, isometric and perspective projections of simple solids.
CO5: Draw the development of simple solids.

TEXT BOOKS:

1. Bhatt N.D. and Panchal V.M., "Engineering Drawing", Charotar Publishing House, 53rd Edition, 2019.
2. Natrajan K.V., "A Text Book of Engineering Graphics", Dhanalakshmi Publishers, Chennai, 2018.
3. Parthasarathy, N. S. and Vela Murali, "Engineering Drawing", Oxford University Press, 2015

REFERENCE BOOKS:

1. Basant Agarwal and Agarwal C.M., "Engineering Drawing", Tata McGraw Hill Publishing Company Ltd, New Delhi, 2008.
2. Gopalakrishna K.R., "Engineering Drawing" (Vol. I&II combined), Subhas Publications, Bangalore, 27th Edition, 2017.
3. Luzzader, Warren.J. and Duff, John M., "Fundamentals of Engineering Drawing with an introduction to Interactive Computer Graphics for Design and Production, Eastern Economy Edition, Prentice Hall of India Pvt. Ltd, New Delhi, 2005.
4. Shah M.B., and Rana B.C., "Engineering Drawing", Pearson Education India, 2nd Edition, 2009.
5. Venugopal K. and Prabhu Raja V., "Engineering Graphics", New Age International (P) Limited, 2008.

CO's, PO's & PSO's MAPPING

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	PSO 1	PSO 2	PSO 3
CO1	3	1	2	-	2	-	-	-	-	3	-	2	3	3	2
CO2	3	1	2	-	2	-	-	-	-	3	-	2	3	3	2
CO3	3	1	2	-	2	-	-	-	-	3	-	2	3	3	2
CO4	3	1	2	-	2	-	-	-	-	3	-	2	3	3	2
CO5	3	1	2	-	2	-	-	-	-	3	-	2	3	3	2
Avg.	3	1	2	-	2	-	-	-	-	3	-	2	3	3	2

1- Low, 2- Medium, 3- High, "-" No Correlation

CHAIRMAN
Board of Studies
Department of Robotics and Automation
Dhirajlal Gandhi College of Technology
Sikkanampatty, Salem - 636 309.

DGCT AUTONOMOUS REGULATIONS – 2024

II SEMESTER

24MCS202	FUNDAMENTALS OF PROGRAMMING WITH C	L	T	P	C
		2	0	2	3

OBJECTIVES:

- To understand the constructs of C Language.
- To develop C Programs using basic programming constructs
- To develop C programs using arrays and strings.
- To develop modular applications in C using functions.
- To develop applications in C using pointers and structures.
- To do input/output and file handling in C

UNIT - I BASICS OF C PROGRAMMING 9

Introduction to programming paradigms – Applications of C Language - Structure of C program - C programming: Data Types - Constants – Enumeration Constants - Keywords – Operators: Precedence and Associativity - Expressions - Input/output statements, Assignment statements – Decision making statements - Switch statement - Looping statements – Preprocessor directives - Compilation process

UNIT - II ARRAYS AND STRINGS 9

Introduction to Arrays: Declaration, Initialization – One dimensional array –Two dimensional arrays - String operations: length, compare, concatenate, copy – Selection sort, linear and binary search.

Unit - III FUNCTIONS AND POINTERS 9

Modular programming - Function prototype, function definition, function call, Built-in functions (string functions, math functions) – Recursion, Binary Search using recursive functions –Pointers – Pointer operators – Pointer arithmetic – Arrays and pointers – Array of pointers – Parameter passing: Pass by value, Pass by reference.

UNIT - IV STRUCTURES AND UNION 9

Structure - Nested structures – Pointer and Structures – Array of structures – Self referential structures – Dynamic memory allocation - Singly linked list – type def – Union - Storage classes and Visibility.

UNIT - V FILE PROCESSING 9

Files – Types of file processing: Sequential access, Random access – Sequential access file - Random access file - Command line arguments.

TOTAL PERIODS : 45

LIST OF EXPERIMENTS:

1. I/O statements, operators, expressions
2. Decision-making constructs: if-else, switch-case, break-continue and Loops: for, while, do-while
3. Arrays: 1D and 2D, Multi-dimensional arrays, traversal
4. Strings: operations
5. Functions: call, return, passing parameters, passing arrays to function and Recursion.

CHAIRMAN
Board of Studies
Department of Robotics and Automation
Dhirajlal Gandhi College of Technology
Sikkanampatty, Salem - 636 309.

6. Pointers: Pointers to functions, Arrays, Strings, Pointers to Pointers, Array of Pointers
7. Structures: Nested Structures, Pointers to Structures, Arrays of Structures and Unions.

TOTAL PERIODS :15

COURSE OUTCOME: At the end of the course, learners will be able to

CO1 - Demonstrate knowledge on C Programming constructs
CO2 - Develop simple applications in C using basic constructs
CO3 - Design and implement applications using arrays and strings
CO4 - Develop and implement modular applications in C using functions.
CO5 - Develop applications in C using structures and pointers.

TEXT BOOKS:

1. ReemaThareja, "Programming in C", Oxford University Press, Second Edition, 2016.
2. Kernighan, B.W and Ritchie,D.M, "The C Programming language", Second Edition, Pearson Education, 2015.

REFERENCE BOOKS:

1. Paul Deitel and Harvey Deitel, "C How to Program with an Introduction to C++", Eighth edition, Pearson Education, 2018.
2. YashwantKanetkar, Let us C, 17th Edition, BPB Publications, 2020.
3. Byron S. Gottfried, "Schaum's Outline of Theory and Problems of Programming with C", McGraw-Hill Education, 1996.
4. PradipDey, Manas Ghosh, "Computer Fundamentals and Programming in C", Second 5. Edition, Oxford University Press, 2013.
5. Anita Goel and Ajay Mittal, "Computer Fundamentals and Programming in C",
   1st Edition, Pearson Education, 2013.
6. Martin C. Brown, "Python: The Complete Reference", 4th Edition, Mc-Graw Hill, 2018.

CO's, PO's & PSO's MAPPING

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	PSO 1	PSO 2	PSO 3
CO1	1	2	2	1	2	-	1	1	2	-	3	2	1	2	1
CO2	2	2	2	1	2	-	1	1	2	-	3	3	2	2	2
CO3	2	3	2	1	2	-	1	1	2	-	3	2	2	2	2
CO4	3	2	2	1	3	-	1	1	2	-	3	3	2	2	3
CO5	2	3	3	1	2	-	2	1	2	-	3	2	2	3	2
Avg	2	2	3	2	1	-	-	-	2	-	2	2	2	2	2

1- Low, 2- Medium, 3- High, "-" No Correlation

CHAIRMAN
Board of Studies
Department of Robotics and Automation
Dhirajlal Gandhi College of Technology
Sikkanampatty, Salem - 636 309.

DGCT AUTONOMOUS REGULATIONS – 2024

II SEMESTER

24MEE201	BASIC ELECTRICAL AND ELECTRONICS ENGINEERING	L	T	P	C
		2	0	2	3

OBJECTIVES:

- To introduce the basics of electric circuits and analysis
- To impart knowledge in the basics of working principles and application of electrical machines
- To introduce analog devices and their characteristics
- To educate on the fundamental concepts of digital electronics
- To introduce the functional elements and working of measuring instruments

UNIT - I ELECTRICAL CIRCUITS 9

DC Circuits: Circuit Components: Conductor, Resistor, Inductor, Capacitor – Ohm's Law - Kirchhoff's Laws –Simple problems. Introduction to AC Circuits and Parameters: Waveforms, Average value, RMS Value, Instantaneous power, real power, reactive power and apparent power, power factor.

UNIT - II MAGNETIC CIRCUITS AND TRANSFORMERS 9

Ampere's Law – Basic Definition: Flux, Flux Density, Field Strength, Permeability, Reluctance, Permeance – Theory of Magnetism –Hysteresis and Eddy-Current Losses - Magnetic Circuit - Self Inductance, Mutual inductance, Co-efficient of Coupling- Comparison between Electric and Magnetic Circuits–Transformers – Theory of Operation.

UNIT - III ELECTRICAL MACHINES 9

Construction and Working principle- DC Separately and Self excited Generators, EMF equation, Types and Applications. Working Principle of DC motors, Torque Equation, Construction, Working principle and Applications of Transformer, Three phase Alternator, Three Phase Induction Motor.

UNIT - IV ANALOG AND DIGITAL ELECTRONICS 9

Semiconductor Materials: Silicon &Germanium – PN Junction Diodes, Zener Diode – Characteristics Applications – Bipolar Junction Transistor Configuration, JFET. Types, I-V Characteristics and Applications. Review of number systems, binary codes, and Combinational logic Circuits (Adder-Subtractor-Encoder & Decoder)

UNIT - V MEASUREMENTS AND INSTRUMENTATION 9

Functional elements of an instrument, Operating Principle, types -Moving Coil and Moving Iron meters, Measurement of three phase power, Energy Meter. Study on Sensors- Resistive Sensor - Capacitive Sensor – LVDT Sensor – Pressure Sensor.

TOTAL PERIODS : 45

LIST OF EXPERIMENTS:

1. Simulation and experimental verification of Kirchhoff's laws
2. Experimental verification of load test on DC motor
3. Experimental verification of load test on Transformer
4. Simulation and experimental verification of transistor characteristics
5. Simulation and experimentation of logic gates

CHAIRMAN
Board of Studies
Department of Robotics and Automation
Dhirajlal Gandhi College of Technology
Sikkanampatty, Salem - 636 309.

6. Simulation of combinational logic circuits (Adder-Subtractor)
7. Simulation and experimental verification of Kirchhoff's laws
8. Experimental verification of load test on DC motor

TOTAL PERIODS :15

COURSE OUTCOMES: At the end of the course, learners will be able to

CO1 - Compute the electric circuit parameters for simple problems
CO2 - Compute the magnetic circuit parameters for transformer
CO3 - Explain the working principle and applications of electrical machines
CO4 - Analyze the characteristics of analog electronic devices
CO5 - Explain the operating principles of measuring instruments.

TEXT BOOKS:

1. B.L. Theraja and A. K. Theraja, "A Text Book of Electrical Technology", S.Chand Publication, Vol 2, 2014
2. A. Sudhakarand S.P Shyam Mohan, "Circuits, Network Analysis and Synthesis", Tata McGraw Hill, Fifth Edition, 2015

REFERENCE BOOKS:

1. D.P. Kothari and I.J. Nagrath, "Basic Electrical Engineering", TataMcGraw Hill, Fourth Edition, 2011
2. V.K.Metha, RohitMetha, "Principles of Electrical Engineering and Electronics", Second edition, S.Chand Publication, 2015
3. S.K.Bhattacharya "Basic Electrical and Electronics Engineering" Pearson Education India, 2012
4. V.N. Mittle and Aravind Mittal "Basic Electrical Engineering", Tata McGraw Hill, Second edition, 2005
5. D.P. Kothari and I.J. Nagrath, "Basic Electrical Engineering", TataMcGraw Hill, Fourth Edition, 2011
6. V.K.Metha, RohitMetha, "Principles of Electrical Engineering and Electronics", Second edition, S.Chand Publication, 2015

CO's, PO's & PSO's MAPPING

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	PSO 1	PSO 2	PSO 3
CO1	2	2	1	-	-	-	-	1	-	-	-	2	-	-	-
CO2	2	2	1	-	-	-	-	1	-	-	-	2	-	-	-
CO3	2	1	1	-	-	-	-	1	-	-	-	2	-	-	-
CO4	2	2	1	-	-	-	-	1	-	-	-	2	-	-	-
CO5	2	2	1	-	-	-	-	1	-	-	-	2	-	-	-
Avg.	2	1.8	1	-	-	-	-	1	-	-	-	2	-	-	-

1- Low, 2- Medium, 3- High, "-" No Correlation

CHAIRMAN
Board of Studies
Department of Robotics and Automation
Dhirajlal Gandhi College of Technology
Sikkanampatty, Salem - 636 309.

DGCT AUTONOMOUS REGULATIONS – 2024

II SEMESTER

24TTA201	தமிழரும் தொழில் நுட்பமும்	L	T	P	C
		1	0	0	1

அலகு I சங்க காலத்தில் நெசவுத் தொழில் பானைத் தொழில்நுட்பம் 3

சங்க காலத்தில் நெசவுத் தொழில் பானைத் தொழில்நுட்பம்- கருப்பு சிவப்பு பாண்டங்கள்- பாண்டங்களில் கீறல் குறியீடுகள்.

அலகு II வடிவமைப்பு மற்றும் கட்டிடத் தொழில்நுட்பம் 3

சங்க காலத்தில் வடிவமைப்பு மற்றும் கட்டுமானங்கள்; சங்க காலத்தில் வீட்டுப்பொருட்களில் வடிவமைப்பு- சங்க காலத்தில் கட்டுமான பொருட்களும் நடுகல்லும் - சிலப்பதிகாரத்தில் மேடை அமைப்பு பற்றிய விவரங்கள் மாமல்லபுரச் சிற்பங்களும்,கோவில்களும் சோழர் காலத்து பெருங்கோயில்கள் - மற்றும் பிற வழிபாட்டுத் தலங்கள் -நாயக்கர் காலக் கோயில்கள் - மாதிரி கட்டமைப்புகள் பற்றி அறிதல், மதுரை மீனாட்சிஅம்மன் ஆலயம் மற்றும் திருமலை நாயக்கர் மஹால் - செட்டிநாட்டு வீடுகள் பிரிட்டிஷ் காலத்தில் சென்னையில் இந்தோ-சாரோசெனிக் கட்டிடக் கலை

அலகு III உற்பத்தித் தொழில் நுட்பம் 3

கப்பல் கட்டும் களல – உகலொகவியல் – இரும்புத் ததொழிற்சொளல – இரும்ளப கப்பல் கட்டும் கலை உலோகவியல் இரும்புத் தொழிற்சாலை இரும்பை உருக்குதல் எஃகு
வரலாற்றுச் சான்றுகளாக செம்பு மற்றும் தங்க நாணயங்கள் - நாணயங்கள் அச்சடித்தல் மணி உருவாக்கும் தொழிற்சாலைகள் - கல்மணிகள், கண்ணாடி மணிகள் - சுடுமண் மணிகள்-சங்கு மணிகள் எலும்பு துண்டுகள் தொல்லியல் சான்றுகள் சிலப்பதிகாரத்தில் மணிகளின் வகைகள்.

அலகு IV வேளாண்மை மற்றும் நீர்ப்பாசனத் தொழில் நுட்பம் 3

அணை, ஏரி, குளங்கள், மதகு சோழர்காலக் குமுழித் தூம்பின் முக்கியத்துவம் – கால்நடை பராமரிப்பு கால்நடைகளுக்காக வடிவமைக்கப்பட்ட கிணறுகள் வேளாண்மை மற்றும் வேளாண்மை சார்ந்த செயல்பாடுகள் -கடல்சார் அறிவு - முத்து மற்றும் முத்துக்குளித்தல் பெருங்கடல் குறித்த பண்டைய அறிவு அறிவுசார் சமூகம்.

அலகு V அறிவியல் தமிழ் மற்றும் கணினித் தமிழ் 3

அறிவியல் தமிழின் வளர்ச்சி கணித்தமிழ் வளர்ச்சி - தமிழ் நூல்களை மின்பதிப்பு செய்தல் தமிழ் மென்பொருட்கள் உருவாக்கம் தமிழ் இணையக் கல்விக்கழகம் - தமிழ் மின் நூலகம்- இணையத்தில் தமிழ் அகராதிகள் சொற்குவைத் திட்டம்.

TOTAL PERIODS : 15

TEXT BOOKS:

1. தமிழக வரலாறு மக்களும் பண்பாடும் தமிழ்நாடு பாடநூல் மற்றும் கே.கே. பிள்ளை (வெளியீடு தமிழ்நாடு பாடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்).
2. கணினித் தமிழ் – முளனவர் இல. சுந்தரம். (விகடன் பிரசுரம்).
3. கீழடி- வைகை நதிக்கரையில் சங்ககால நகர நாகரிகம் (தொல்லியல் துறை வெளியீடு)
4. பொருநை - ஆற்றங்கரை நாகரிகம். (தொல்லியல் துறை வெளியீடு)

REFERENCE BOOKS:

1. Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL – (in print)
2. Social Life of the Tamils - The Classical Period (Dr.S.Singaravelu) (Published by: International Institute of Tamil Studies.
3. Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukkarasu) (Published by: International Institute of Tamil Studies).
4. The Contributions of the Tamils to Indian Culture (Dr.M.Valarmathi) (Published by: International Institute of Tamil Studies.)
5. Keeladi - 'Sangam City Civilization on the banks of river Vaigai' (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
6. Studies in the History of India with Special Reference to Tamil Nadu (Dr.K.K.Pillay) (Published by: The Author)
7. Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
8. Journey of Civilization Indus to Vaigai (R.Balakrishnan) (Published by: RMRL)

CHAIRMAN
Board of Studies
Department of Robotics and Automation
Dhirajlal Gandhi College of Technology
Sikkanampatty, Salem - 636 309.

DGCT AUTONOMOUS REGULATIONS – 2024

II SEMESTER

24TTA201	TAMILS AND TECHNOLOGY	L	T	P	C
		1	0	0	1

UNIT - I WEAVING AND CERAMIC TECHNOLOGY 3

Weaving Industry during Sangam Age – Ceramic technology – Black and Red Ware Potteries (BRW) – Graffiti on Potteries

UNIT - II DESIGN AND CONSTRUCTION TECHNOLOGY 3

Designing and Structural construction House & Designs in household materials during Sangam Age - Building materials and Hero stones of Sangam age – Details of Stage Constructions in Silappathikaram - Sculptures and Temples of Mamallapuram - Great Temples of Cholas and other worship places - Temples of Nayaka Period - Type study (Madurai Meenakshi Temple)- ThirumalaiNayakarMahal - Chetti Nadu Houses, Indo - Saracenic architecture at Madras during British Period

UNIT - III MANUFACTURING TECHNOLOGY 3

Art of Ship Building - Metallurgical studies - Iron industry - Iron smelting, steel -Copper and gold- Coins as source of history - Minting of Coins – Beads making-industries Stone beads - Glass beads - Terracotta beads -Shell beads/ bone beats - Archeological evidences - Gem stone types described in Silappathikaram.

UNIT - IV AGRICULTURE AND IRRIGATION TECHNOLOGY 3

Dam, Tank, ponds, Sluice, Significance of KumizhiThoompu of Chola Period, Animal Husbandry - Wells designed for cattle use - Agriculture and Agro Processing - Knowledge of Sea - Fisheries – Pearl - Conche diving - Ancient Knowledge of Ocean - Knowledge Specific Society

UNIT - V SCIENTIFIC TAMIL & TAMIL COMPUTING 3

Development of Scientific Tamil - Tamil computing – Digitalization of Tamil Books – Development of Tamil Software – Tamil Virtual Academy – Tamil Digital Library – Online Tamil Dictionaries – Sorkuvai Project.

TOTAL PERIODS : 15

TEXT BOOKS:

1. தமிழக வரலாறு - மக்களும் பண்பாடும் - கே.கே. பிள்ளை (வெளியீடு: தமிழ்நாடு பாடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்).
2. கணினித் தமிழ் - முனைவர் இல. சுந்தரம். (விகடன் பிரசுரம்).
3. கீழடி - வைகை நதிக்கரையில் சங்ககால நகர நாகரிகம் (தொல்லியல் துறை வெளியீடு).
4. பொருநை - ஆற்றங்கரை நாகரிகம். (தொல்லியல் துறை வெளியீடு).

CHAIRMAN
Board of Studies
Department of Robotics and Automation
Dhirajlal Gandhi College of Technology
Sikkanampatty, Salem - 636 309.

REFERENCE BOOKS:

1. Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL – (in print)
2. Social Life of the Tamils - The Classical Period (Dr.S.Singaravelu) (Published by: International Institute of Tamil Studies.
3. Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukkarasu) (Published by: International Institute of Tamil Studies).
4. The Contributions of the Tamils to Indian Culture (Dr.M.Valarmathi) (Published by: International Institute of Tamil Studies.)
5. Keeladi - 'Sangam City Civilization on the banks of river Vaigai' (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation
6. Studies in the History of India with Special Reference to Tamil Nadu (Dr.K.K.Pillay) (Published by: The Author)
7. Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
8. Journey of Civilization Indus to Vaigai (R.Balakrishnan) (Published by: RMRL) – Reference Book.

CHAIRMAN
Board of Studies
Department of Robotics and Automation
Dhirajlal Gandhi College of Technology
Sikkanampatty, Salem - 636 309.

DGCT AUTONOMOUS REGULATIONS – 2024

II SEMESTER

24LME201	ENGINEERING PRACTICES LABORATORY	L	T	P	C
		0	0	3	1.5

OBJECTIVES

1. Drawing pipe line plan; laying and connecting various pipe fittings used in common household plumbing work; Sawing; planing; making joints in wood materials used in common household wood work.
2. Welding various joints in steel plates using arc welding work; Machining various simple processes like turning, drilling, tapping in parts; Assembling simple mechanical assembly of common household equipments; Making a tray out of metal sheet using sheet metal work.
3. Wiring various electrical joints in common household electrical wire work.
4. Soldering and testing simple electronic circuits; Assembling and testing simple electronic components on PCB

GROUP A (CIVIL & MECHANICAL)

PART - I CIVIL ENGINEERING PRACTICES 12

PLUMBING WORK:

1. Connecting various basic pipe fittings like valves, taps, coupling, unions, reducers, elbows and other components which are commonly used in household.
2. Preparing plumbing line sketches.
3. Laying pipe connection to the suction side of a pump
4. Laying pipe connection to the delivery side of a pump.
5. Connecting pipes of different materials: Metal, plastic and flexible pipes used in household appliances.

WOOD WORK:

1. Sawing
2. Planing
3. Making joints like T-Joint Mortise joint and Tenon joint and Dovetail joint.

WOOD WORK STUDY

1. Studying joints in door panels and wooden furniture
2. Studying common industrial trusses and models

PART - II MECHANICAL ENGINEERING PRACTICES 11

WELDING WORK:

1. Welding of Butt Joints, Lap Joints, and Tee Joints using arc welding.
2. Practicing gas welding.

BASIC MACHINING WORK:

1. Simple Turning
2. Simple Drilling
3. Simple Tapping

SHEET METAL WORK:

1. Making of a square tray

FOUNDRY WORK:

1. Demonstrating basic foundry operations.

ASSEMBLY WORK:

CHAIRMAN
Board of Studies
Department of Robotics and Automation
Dhirajlal Gandhi College of Technology
Sikkanampatty, Salem - 636 309.

1. Assembling a centrifugal pump.
2. Assembling a household mixer.
3. Assembling an air conditioner.

GROUP B(ELECTRICAL & ELECTRONICS)

PART - III ELECTRICAL ENGINEERING PRACTICES **11**

1. Introduction to switches, fuses, indicators and lamps - Basic switch board wiring with lamp, fan and three pin socket
2. Staircase wiring
3. Fluorescent Lamp wiring with introduction to CFL and LED types.
4. Energy meter wiring and related calculations/ calibration
5. Study of Iron Box wiring and assembly
6. Study of Fan Regulator (Resistor type and Electronic type using Diac/Triac/quadrac)
7. Study of emergency lamp wiring/Water heater / Induction stove

PART - IV ELECTRONICS ENGINEERING PRACTICES **11**

SOLDERING WORK:

1. Soldering simple electronic circuits and checking continuity.

ELECTRONIC ASSEMBLY AND TESTING WORK:

1. Assembling and testing electronic components on a small PCB.

ELECTRONIC EQUIPMENT STUDY:

1. Study an elements of smart phone..
2. Assembly and dismantle of LED TV.
3. Assembly and dismantle of computer/ laptop
4. Study of Washing machine

Total Periods : 45

COURSE OUTCOMES: At the end of the course students would be able to

CO1 - Draw pipe line plan; lay and connect various pipe fittings used in common household plumbing work; Saw; plan; make joints in wood materials used in common household wood work.

CO2 - Wire various electrical joints in common household electrical wire work.

CO3 - Weld various joints in steel plates using arc welding work; Machine various simple processes like turning, drilling, tapping in parts; Assemble simple mechanical assembly of common household equipments; Make a tray out of metal sheet using sheet metal work.

CO4 - Solder and test simple electronic circuits; Assemble and test simple electronic components on PCB.

CO's, PO's & PSO's MAPPING

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	-	-	2	1	-	1	2	1	2	3	3	2
CO2	3	2	2	-	-	2	1	-	1	2	1	2	3	3	2
CO3	3	2	2	-	-	2	1	-	1	2	1	2	3	3	2
CO4	3	2	2	-	-	2	1	-	1	2	1	2	3	3	2
Avg.	3	2	2	-	-	2	1	-	1	2	1	2	3	3	2

1- Low, 2- Medium, 3- High, "-" No Correlation

CHAIRMAN
Board of Studies
Department of Robotics and Automation
Dhirajlal Gandhi College of Technology
Sikkanampatty, Salem - 636 309.