

## DGCT AUTONOMOUS REGULATIONS - 2024

## II SEMESTER

24MEN201

PROFESSIONAL ENGLISH II

L	T	P	C
2	0	2	3

## COURSE OBJECTIVES:

- To engage learners in meaning ful 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



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**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 analyze 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.

**TEXT BOOKS:**

1. English for Engineers & Technologists (2020 edition) Orient Blackswan Private Ltd.  
Department of English, Anna University
2. Authored by Dr. Veena Selvam, Dr. Sujatha Priyadarshini, Dr. Deepa Mary Francis, Dr. KN. Shoba, and Dr. Lourdes Jovani, Department of English, Anna University.

**REFERENCE BOOKS:**

1. Raman. Meenakshi, Sharma. Sangeeta (2019). Professional English. Oxford university press. New Delhi.
2. Improve Your Writing ed. V.N. Arora and Laxmi Chandra, Oxford Univ. Press, 2001, New Delhi
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, Meera Bannerji- Macmillan India Ltd. 1990, Delhi

  
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**CO's - PO's & PSO's MAPPING**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C01	3	3	3	3	3	3	3	3	2	3	3	3	-	-
C02	3	3	3	3	3	3	3	3	2	3	3	3	-	-
C03	3	3	3	3	3	3	3	3	2	3	3	3	-	-
C04	3	3	3	3	2	3	3	3	2	3	3	3	-	-
C05	-	-	-	-	-	-	-	-	3	3	3	3	-	-
Avg	3	3	3	3	2.75	3	3	3	2.2	3	3	3	-	-

1-low, 2-medium, 3-high, '-' - no correlation

  
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## DGCT AUTONOMOUS REGULATIONS - 2024

## II SEMESTER

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

## COURSE 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 linear equations– Legendre's linear equations.

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

Laplace transform – Sufficient condition for existence – Transform of elementary functions –Change of Scale Property and Shifting Property – Problems based on properties – Transform of periodic functions. Inverse Laplace transform – Statement of Convolution theorem – Problems based on Convolution theorem.

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

Analytic functions – Necessary and sufficient conditions for analyticity ( Proof excluded )- Test the analyticity of some standard complex functions – Cauchy-Riemann equations in Cartesian coordinates (Proof excluded) - Harmonic function – Conformal mapping:  $z+k$ ,  $kz$ ,  $\frac{1}{z}$  – Fixed points – Critical points – Bilinear transformation.

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

Complex integration – Statement and applications of Cauchy's integral theorem and Cauchy's integral formula – Laurent's series expansions – Poles – Singular points – Residues – Cauchy's residue theorem(excluding proof) – Problems based on Cauchy's residue theorem'.

**UNIT - V VECTOR CALCULUS 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**

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**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. Rajnish Verma, "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**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	1	1	1	0	0	0	2	0	2	3	-	-
CO2	3	3	1	1	1	0	0	0	2	0	2	3	-	-
CO3	3	3	1	1	1	0	0	0	2	0	2	3	-	-
CO4	3	3	1	1	1	0	0	0	2	0	2	3	-	-
CO5	3	3	1	1	1	0	0	0	2	0	2	3	-	-
Avg	3	3	1	1	1	0	0	0	2	0	2	3	-	-

1-low, 2-medium, 3-high, '-' - no correlation

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**DGCT AUTONOMOUS REGULATIONS – 2024  
II SEMESTER**

<b>24TEE202</b>	<b>BASIC ELECTRICAL AND INSTRUMENTATION ENGINEERING</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>

**COURSE OBJECTIVES:**

- To introduce the basics of magnetic circuits
- To impart knowledge in the basics of working principles and application of DC I machines
- To impart knowledge in the basics of working principles and application of AC I machines
- To educate on the fundamental concepts of power systems
- To introduce the functional elements and working of measuring instruments and sensors

**UNIT 1 MAGNETIC CIRCUITS** **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.

**UNIT II DC MACHINES** **9**

Construction and Working principle- DC Separately and Self excited Generators, EMF equation, Types and Applications. Working Principle of DC motors -Types, Characteristics, Torque Equation, speed control methods-Applications, Stepper Motor and BLDC Motor.

**UNIT III AC MACHINES** **9**

Principle of operation of three-phase induction motors – Construction –Types – Speed Control - Single phase Induction motors -Construction– Types–starting methods. Alternator: Working principle–Equation of induced EMF –Transformer types and working principle – Efficiency and Voltage REGULATIONS– Three Phase Transformers –Applications- Auto Transformers, Advantages.

**UNIT IV BASICS OF POWER SYSTEMS** **9**

Power system structure -Generation , Transmission and distribution , Various voltage levels, Earthing – methods of earthing, protective devices- switch fuse unit- Miniature circuit breaker - earth leakage circuit breaker, safety precautions and First Aid.

**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, Instrument Transformers-CT and PT, Study on Sensors- Resistive Sensor - Capacitive Sensor – LVDT Sensor – Pressure Sensor – Encoder Sensor - Proximity Sensor - Ultrasonic Sensor-temperature and humidity-LDR sensor.

**Total Periods:45**

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**COURSE OUTCOMES:**

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

- CO1: Compute the electric circuit parameters for simple problems
- CO2: Explain the working principle and applications of electrical machines
- CO3: Analyze the characteristics of analog electronic devices
- CO4: Explain the basic concepts of digital electronics
- 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. Sudhakar and S.P Shyam Mohan, "Circuits, Network Analysis and Synthesis", Tata McGraw Hill, Fifth Edition, 2015.


**REFERENCES BOOKS:**

1. D.P. Kothari and I.J. Nagrath, "Basic Electrical Engineering", Tata McGraw 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.

**CO's - PO's & PSO's MAPPING**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
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

  
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## DGCT AUTONOMOUS REGULATIONS – 2024

## II SEMESTER

24TEC201

ELECTRON DEVICES

L	T	P	C
3	0	0	3

**COURSE OBJECTIVES:**

- To understand the methods of biasing transistors.
- To design and analyze single stage and multistage amplifier circuits.
- To analyze the frequency response of small signal amplifiers.
- To design and analyze the regulated DC power supplies.
- To troubleshoot and fault analysis of power supplies.

**UNIT - I SEMICONDUCTOR PHYSICS**

9

Energy bands in intrinsic and extrinsic semiconductors, equilibrium carrier concentration, direct and indirect band-gap semiconductors. Carrier transport: diffusion current, drift current, mobility and resistivity, Poisson and continuity equations, generation and recombination of carriers.

**UNIT - II SEMICONDUCTOR DIODE**

9

Theory of PN Junction Diode and Zener diode – Characteristics, Temperature dependence- Break down mechanisms- Diode Resistance- Diode Capacitance- Diode Models- Rectifiers- Clipper- Clamper- Voltage regulator Tunnel Diode, Varactor Diodes.

**UNIT - III BIPOLAR JUNCTION TRANSISTOR**

9

Transistor types - Transistor Action - Current Components –Configurations - Transistor as a Switch and Amplifier - Small Signal Low Frequency Hybrid and  $\pi$  Model - Ebers Moll Model - DC and AC Load Lines - Operating Point - Bias stability, Bias Methods, Bias Compensation.

**UNIT - IV FIELD EFFECT TRANSISTORS**

9

JFET – Operation and Characteristics, MOSFET: Physical Operation, Current—Voltage Characteristics, Threshold voltage equations – MOS device equations, MOSFET as an Amplifier and Switch, MOS Capacitor ,Small-Signal Operation and Models , MOSFET Configurations and Biasing- Second order effects.

**UNIT - V POWER DEVICES AND DISPLAY DEVICES**

9

UJT, SCR, Diac, Triac, Power BJT- Power MOSFET- DMOS-VMOS. LED, LCD, Photo transistor, Opto Coupler, Solar cell.

**Total Periods : 45**


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**COURSE OUTCOMES:**

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

- CO1: Understand the basics of electron ballistics and semiconductor physics
- CO2: Explain the basics of device physics and working principle of diode
- CO3: Describe the construction, operation and applications of BJT
- CO4: Analyze of MOSFET amplifier.
- CO5: Explain the construction and working principle of power semiconductor devices and optoelectronic and display devices

**TEXT BOOKS:**

1. Millman], Halkias C. C., Satyabrata J, "Electronic Devices and Circuits", McGraw Hill Education (I)P Ltd, Chennai 2019.
2. Salivahanan S and Sureshkumar N, Electronic Devices and Circuits, McGraw Hill Education, Fourth Edition, 2017.


**REFERENCE BOOKS:**

1. Floyd T. L, "Electronic Devices and Circuits", Pearson, Chennai, 2021.
2. David A.Bell , "Electronic Devices and Circuits", Oxford University Press , New Delhi, 2021.
3. Sedra and Smith, "Microelectronic Circuits", Seventh Edition, Oxford University Press, New Delhi, 2022.
4. Boylestad, R. L. and Nashelsky, L., "Electronic Devices and Circuit Theory", Pearson, Chennai, 2021.

**CO's - PO's & PSO's MAPPING**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	2	2	-	-	-	-	-	-	-	-	-	1
CO2	2	3	2	2	-	-	-	-	-	-	-	-	-	2
CO3	2	3	2	2	-	-	-	-	-	-	-	-	-	-
CO4	3	3	3	1	-	-	-	-	-	-	-	-	-	1
CO5	2	3	2	2	-	-	-	-	-	-	-	-	-	-
Avg	3	3	3	2	-	-	-	-	-	-	-	-	-	-

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**DGCT AUTONOMOUS REGULATIONS – 2024**  
**II SEMESTER**

24TEC202

CIRCUIT ANALYSIS

L	T	P	C
3	0	0	3

**COURSE OBJECTIVES:**

- To introduce electric circuits and develop the ability to apply circuit analysis to DC and AC circuits
- To understand various methods of circuit/ network analysis using network theorems.
- To introduce the phenomenon of resonance in coupled circuits.
- To obtain the transient response of circuits using Laplace transform.
- To learn the concept of coupling in circuits and topologies

**UNIT - I BASIC CIRCUITS ANALYSIS**

9

Ohm's Law – Kirchoffs laws – DC and AC Circuits – Resistors in series and parallel circuits – Network reduction: voltage and current division, source transformation – star and delta conversion – Mesh current and node voltage method of analysis for D.C and A.C. circuits.

**UNIT - II NETWORK THEOREM FOR DC AND AC CIRCUITS AND DUALITY**

9

Network theorems - Linearity and superposition, Thevenin and Norton Equivalent Circuits, Maximum Power Transfer, Duals, Dual circuits. Analysis using dependent current sources and voltage sources.

**UNIT - III SINUSOIDAL STEADY STATE ANALYSIS AND RESONANCE**

9

Sinusoidal Steady – State analysis, Characteristics of Sinusoids, The Complex Forcing Function, The Phasor, Phasor relationship for R, L, and C, impedance and Admittance. Resonance - Series resonance - Parallel resonance – Bandwidth - Q factor - Selectivity.

**UNIT - IV TRANSIENTS ANALYSIS**

9

Basic RL and RC Circuits, The Source- Free RL Circuit, The Source-Free RC Circuit, The Unit Step Function, Driven RL Circuits, Driven RC Circuits, RLC Circuits, Frequency Response.

**UNIT - V COUPLED CIRCUITS AND TOPOLOGY**

9

Self inductance - Mutual inductance - Dot rule - Coefficient of coupling - Analysis of magnetically coupled circuits - Series, Parallel connection of coupled inductors .Graph of a network - Incidence and reduced incidence matrices – Trees –Cutsets - Fundamental cutsets - Cutset matrix – Tie sets - Link currents and Tie set schedules -Twig voltages and Cutset schedules.

**Total Periods : 45****COURSE OUTCOMES:****At the end of the course, learners will be able to**

- CO1:** Apply the basic concepts of circuit analysis such as Kirchoff's laws, mesh current and node voltage method for analysis of DC and AC circuits.
- CO2:** Apply suitable network theorems to analyze AC and DC circuits.
- CO3:** Analyze steady state response of any R, L and C circuits and frequency response of parallel and series resonance circuits.

CO4: Analyze the transient response for any RC, RL and RLC circuits .

CO5: Analyze the coupled circuits and network topologies.

**TEXT BOOKS:**

1. Hayt Jack Kemmerly, Steven Durbin, "Engineering Circuit Analysis", Mc Graw Hill education, 9<sup>th</sup> Edition, 2018.
2. Charles K. Alexander & Mathew N.O.Sadiku, "Fundamentals of Electric Circuits", Mc GrawHill, 2<sup>nd</sup> Edition, 2003.


**REFERENCE BOOKS:**

- 1.Sudhakar A and Shyam Mohan SP, "Circuits and Network Analysis and Synthesis", Tata McGraw Hill, 2007.
- 2.Robert L. Boylestead, "Introductory Circuit Analysis", Pearson Education India, 12th Edition, 2014.
- 3.David Bell, "Fundamentals of Electric Circuits", Oxford University press, 7th Edition, 2009.
- 4.John O Mallay, Schaum's Outlines "Basic Circuit Analysis", The Mc Graw Hill companies, 2<sup>nd</sup> Edition, 2011.

**CO's - PO's & PSO's MAPPING**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	1	1	-	-	-	-	-	-	-	-	-	-
CO2	3	3	2	2	-	-	-	-	-	-	-	-	-	-
CO3	3	3	3	3	-	-	-	-	-	-	-	-	-	-
CO4	3	3	3	3	-	-	-	-	-	-	-	-	-	-
CO5	3	3	3	2	-	-	-	-	-	-	-	-	-	-
Avg	3	3	3	2	-	-	-	-	-	-	-	-	-	-

1-low, 2-medium, 3-high, '-' - no correlation

  
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**DGCT AUTONOMOUS REGULATIONS – 2024  
II SEMESTER**

<b>24TIT402</b>	<b>ADVANCED PYTHON PROGRAMMING</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>

**COURSE OBJECTIVES:**

- To apply advanced Python techniques, including Object-Oriented Programming, to create efficient software.
- To handle files, process data, and optimize performance for large datasets.
- To use relational and NoSQL databases to build secure applications.
- To develop web applications, create APIs, and perform web scraping for practical problems.
- To prepare for industry roles by learning testing, concurrency, cloud integration, and deployment tools.

**UNIT – I OBJECT ORIENTED PROGRAMMING 9**

OOPS Concepts, Classes and objects , Classes in Python, Constructors, Data hiding, Creating Classes, Instance Methods, Special Methods, Class Variables, Inheritance, Polymorphism, Type Identification, Custom Exception Classes, Iterators, generators and decorators.

**UNIT – II FILE HANDLING AND DATA PROCESSING 9**


File I/O Operations: Reading/writing text and binary files - File handling with error management - Data Serialization: Working with JSON, XML, and YAML - Using pickle for object serialization - Large File Processing: Streaming data from large files - Performance optimization techniques.

**UNIT – III DATABASE PROGRAMMING WITH PYTHON 9**

Relational Databases: SQL basics: CRUD operations - Using sqlite3 and connectors for MySQL/PostgreSQL - Query parameterization and security - Object-Relational Mapping (ORM): Introduction to SQLAlchemy - Query building and database transactions using ORM - NoSQL Databases: Basics of NoSQL and MongoDB - Interfacing with Mongo DB using pymongo.

**UNIT - IV WEB DEVELOPMENT AND APIS 9**

Web Frameworks: Introduction to Flask - Routing, templates, and basic authentication - REST APIs: Building RESTful APIs with Flask - Consuming third-party APIs - Web Scraping: Extracting web data using BeautifulSoup and Scrapy.

  
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**UNIT – V      ADVANCED CONCEPTS AND INDUSTRY TOOLS**

**9**

Testing and Debugging: Unit testing with unittest and pytest - Logging and debugging using pdb - Concurrency and Parallelism: Multithreading and multiprocessing - Asynchronous programming with asyncio - Packaging and Deployment: Creating reusable Python packages - Dockerizing Python applications for deployment - Cloud Integration: Using Python SDKs for AWS (Boto3) or Azure - Deploying applications on Heroku or AWS Lambda.

**Total Periods : 45**

**COURSE OUTCOMES:**

**At the end of the course, learners will be able to**


- CO1:** Apply advanced Python techniques, including Object-Oriented Programming, to create efficient software.
- CO2:** Handle files, process data, and optimize performance for large datasets.
- CO3:** Use relational and NoSQL databases to build secure applications.
- CO4:** Develop web applications, create APIs, and perform web scraping for practical problems.
- CO5:** Prepare for industry roles by learning testing, concurrency, cloud integration, and deployment tools.

**TEXT BOOKS:**

1. Michael H. Goldwasser, David Letscher, "Object-Oriented Programming in Python", McGraw-Hill Education, 1st Edition, 2008
2. Miguel Grinberg, "Flask Web Development: Developing Web Applications with Python", O'Reilly Media, 2nd Edition, 2018
3. Katharine Jarmul and Richard Lawson, "Python Web Scraping: Hands-on Data Scraping and Crawling Using Python", Packt Publishing, 1st Edition, 2017

**REFERENCE BOOKS:**

1. Brian Okken, "Python Testing with pytest: Simple, Fast, and Scalable", Pragmatic Bookshelf, 1st Edition, 2017
2. <https://docs.python.org/3/tutorial/index.html>
3. <https://www.w3schools.com/python/>
4. <https://python-course.eu/advanced-python/>

  
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**CO's - PO's & PSO's MAPPING**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C01	2	1	2	2	2	-	-	-	1	-	2	2	-	-
C02	2	-	2	1	2	-	-	-	1	-	3	2	1	2
C03	2	1	3	2	2	-	-	-	1	1	2	2	1	1
C04	2	1	2	2	-	-	-	-	1	1	3	2	1	-
C05	2	-	3	2	-	-	-	-	1	1	2	2	1	1
Avg	2	1	2	2	1	-	-	-	1	1	2	2	1	2

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**DGCT AUTONOMOUS REGULATIONS – 2024**  
**II SEMESTER**

24TTA201

தமிழரும் தொழில் நுட்பமும்

L	T	P	C
1	0	0	1

**அலகு I சங்க காலத்தில் நெசவுத் தொழில் பாணைத் தொழில்நுட்பம்**

3

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

**அலகு II வடிவமைப்பு மற்றும் கட்டிடத் தொழில்நுட்பம்**

3

சங்க காலத்தில் வடிவமைப்பு மற்றும் கட்டுமானங்கள்; சங்க காலத்தில் வீட்டுப்பொருட்களின் வடிவமைப்பு- சங்க காலத்தில் கட்டுமான பொருட்களும் நடுகல்லும் -சிலப்பதிகாரத்தில் மேடை அமைப்பு பற்றிய விவரங்கள் மாமல்லபுரச் சிற்பங்களும்,கோவில்களும் சோழர் காலத்தி் 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 களம் - உகலோகவியல் - இரும்புத் ததொழிற்சொளம் - இரும்பு கப்பல் கட்டும் கலை உலோகவியல் இரும்புத் தொழிற்சாலை இரும்பை உருக்குதல் எஃகு வரலாற்றுச் சான்றுகளாக செம்ம மற்றும் தங்க நாணயங்கள் - நாணயங்கள் அச்சடித்தல் மணி உருவாக்கும் தொழிற்சாலைகள் கல்மணிகள், கண்ணடி 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 குழுவித் 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- இணையத்தின் தமிழ் அகராதிகள் சொற்குவைத் திட்டம்.


Total Periods : 15

  
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## TEXT &amp; REFERENCE BOOKS:

1. தமிழக வரலாறு மக்களும் பண்பாடும் தமிழ்நாடு பாடநூல் மற்றும் கே.கே. பிள்ளை (வெளியீடு தமிழ்நாடு பாடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்).
2. கணினித் தமிழ் - முன்னவர் இல. சுந்தரம். (விகடன் பிரசுரம்).
3. கீழடி- வைகை நதிக்கரையில் சங்ககால நகர நாகரிகம் (தொல்லியல் துறை வெளியீடு)
4. பொருளை - ஆற்றங்கரை நாகரிகம். (தொல்லியல் துறை வெளியீடு)
5. Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL – (in print)
6. Social Life of the Tamils - The Classical Period (Dr.S.Singaravelu) (Published by: International Institute of Tamil Studies).
7. Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukkarasu) (Published by International Institute of Tamil Studies).
8. The Contributions of the Tamils to Indian Culture (Dr.M.Valarmathi) (Published by: International Institute of Tamil Studies.)
9. 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)
10. Studies in the History of India with Special Reference to Tamil Nadu (Dr.K.K.Pillay) (Published by The Author)
11. Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
12. Journey of Civilization Indus to Vaigai (R.Balakrishnan) (Published by: RMRL)

  
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DGCT\_R-2024\_B.E.,\_ECE(Curriculum & Syllabus)

**DGCT AUTONOMOUS REGULATIONS - 2024**  
**II SEMESTER**

24LEC201	CIRCUIT AND DEVICES LABORATORY	L	T	P	C
		0	0	3	1.5

**COURSE OBJECTIVES:**

- To gain hands-on experience in Thevenin & Norton theorem, KVL & KCL, and Superposition Theorems.
- To understand the working of RL, RC and RLC circuits.
- To learn the characteristics of basic electronic devices such as Diode, BJT, FET, SCR
- To understand the methods of biasing transistors.
- To study the stability of different biasing techniques.

**List of Experiments:**

**Part I - CIRCUITS EXPERIMENTS**

1. Verifications of KVL & KCL.
2. Verifications of Thevenin & Norton theorem.
3. Transient analysis of RL, RC and RLC circuits.

**Part II - DEVICE EXPERIMENTS**

1. Characteristics of PN Junction diode and Rectifier Circuit.
2. Zener diode Characteristics & Regulator using Zener diode.
3. Common Emitter input-output Characteristics.
4. Common Base input-output Characteristics.

**Part III -SIMULATION EXPERIMENTS (using SPICE)**

1. Verification of Kirchoff's Law
2. Verification of Network Theorems - Superposition and maximum Power transfer Theorem
3. FET and SCR Characteristics.

**Total Periods : 45**

**COURSE OUTCOMES:**

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

- CO1:** Verify KVL & KCL, Thevenin & Norton theorem,
- CO2:** Design and Analyze transient RL & RC circuits.
- CO3:** Analyze the characteristics of basic electronic devices.
- CO4:** Design and Analyze the different biasing techniques and rectifier circuits.
- CO5:** Design and Simulate the Circuit Law, theorem and characteristics of basic electronic devices.


  
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CO's-PO's & PSO's Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	3	2	3	2	-	-	-	-	-	-	-	-	-
2	3	3	3	2	2	-	-	-	-	-	-	-	-	-
3	3	3	2	2	2	-	-	-	-	-	-	-	-	-
4	3	3	3	2	1	-	-	-	-	-	-	-	-	-
5	3	2	3	2	2	-	-	-	-	-	-	-	-	-
Avg	3	3	3	3	2	-	-	-	-	-	-	-	-	-

1-low, 2-medium, 3-high, '-' - no correlation

  
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**DGCT AUTONOMOUS REGULATIONS – 2024  
II SEMESTER**

<b>24LME201</b>	<b>ENGINEERING PRACTICES LABORATORY</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>0</b>	<b>0</b>	<b>3</b>	<b>1.5</b>

**COURSE OBJECTIVES:**

- 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.
- 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.
- Wiring various electrical joints in common household electrical wire work.
- Soldering and testing simple electronic circuits; Assembling and testing simple electronic components on PCB.

**GROUP- A (CIVIL & MECHANICAL)**

**CIVIL ENGINEERING PRACTICES**

**List of Experiments:**

**PLUMBING WORK:**

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

**WOOD WORK:**

- Sawing,
- Planning and
- Making joints like T-Joint, Mortise joint and Tenon joint and Dovetail joint.

**WOOD WORK STUDY**

- Studying joints in door panels and wooden furniture
- Studying common industrial trusses and models

**Total Periods : 13**

**MECHANICAL ENGINEERING PRACTICES**


**WELDING WORK:**

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

**BASIC MACHINING WORK:**

- (Simple) Turning.
- (Simple) Drilling.
- (Simple) Tapping

**ASSEMBLY WORK:**

  
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- a. Assembling a centrifugal pump.
- b. Assembling a household mixer.
- c. Assembling an air conditioner

**SHEET METAL WORK:**

- a. Making of a square tray

**FOUNDRY WORK:**

- a. Demonstrating basic foundry operations.

**Total Periods : 12**

**GROUP- B (ELECTRICAL & ELECTRONICS)**

**ELECTRICAL ENGINEERING PRACTICES**

- a. Introduction to switches, fuses, indicators and lamps - Basic switch board wiring with lamp, fan and three pin socket
- b. Staircase wiring
- c. Fluorescent Lamp wiring with introduction to CFL and LED types.
- d. Energy meter wiring and related calculations/ calibration
- e. Study of Iron Box wiring and assembly
- f. Study of Fan Regulator (Resistor type and Electronic type using Diac/Triac/quadrac)
- g. Study of emergency lamp wiring/Water heater / Induction stove

**Total Periods : 10**

**ELECTRONICS ENGINEERING PRACTICES**

**SOLDERING WORK:**

- a. Soldering simple electronic circuits and checking continuity.

**ELECTRONIC ASSEMBLY AND TESTING WORK:**

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

**ELECTRONIC EQUIPMENT STUDY:**

- a. Study an elements of smart phone..
- b. Assembly and dismantle of LED TV.
- c. Assembly and dismantle of computer/ laptop
- d. Study of Washing Machine


**Total Periods : 10**

**Total Periods : 45**

**COURSE OUTCOMES:**

**At the end of the course the students would be able to**

- CO1:** 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.
- CO2:** 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.
- CO3:** Wire various electrical joints in common household electrical wire work.
- CO4:** Solder and test simple electronic circuits; Assemble and test simple electronic Components on PCB.

  
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**CO's-PO's & PSO's Mapping**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	3	2	1	1	-	-	2	2	-	-	-	-	-
2	3	3	2	1	1	-	-	2	2	-	-	-	-	-
3	3	3	2	1	1	-	-	2	2	-	-	-	-	-
4	3	3	2	1	1	-	-	2	2	-	-	-	-	-
5	3	3	2	1	1	-	-	2	2	-	-	-	-	-
Avg	3	3	2	1	1	-	-	2	2	-	-	-	-	-

1-low, 2-medium, 3-high, '-' - no correlation

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## II SEMESTER

24LIT402

ADVANCED PYTHON PROGRAMMING LABORATORY

L	T	P	C
0	0	3	1.5

**COURSE OBJECTIVES:**

- Use Object-Oriented Programming (OOP) Concepts
- Develop Proficiency in Python Programming
- Implement Web Development with Flask
- Work with Databases and Data Serialization
- Apply Advanced Python Features and Tools

**List of Experiments:**

1. Write a Python program to create a class Car with attributes like brand, model, and year. Then create an object of this class and display its attributes.
2. Define a class Employee with private attributes like name and salary. Provide methods to get and set these attributes. Access the attributes through these methods
3. Create a base class Animal with a method sound(). Create derived classes Dog and Cat, each overriding the sound() method to make a specific sound.
4. Implement the \_\_str\_\_() method in a class to return a human-readable string representing the class instance.
5. Define a custom exception Invalid Age Error and raise it if an age input is less than 0 or greater than 120.
6. Create a generator that yields Fibonacci numbers up to a specified limit. Use this generator to print the first n Fibonacci numbers.
7. Create a decorator that measures the execution time of a function. Apply it to a function that calculates a large factorial.
8. Write a Python program to store a list of dictionaries using pickle, and then load and display the stored object.
9. Write a program that reads a large text file line by line and prints only lines that contain a specific keyword.
10. Use sqlite3 to create a database, a table, and perform basic CRUD (Create, Read, Update, Delete) operations.
11. Build a simple Flask app that displays "Hello, World!" when accessed at the root URL (/).
12. Write a Flask app with multiple routes and use Jinja2 templates to display dynamic content, like a user's name
13. Build a simple Flask REST API that handles GET and POST requests, such as managing a list of tasks.
14. Write unit tests for a Python function that calculates the factorial of a number using the unit test module.
15. Implement logging in your Python program to track errors. Use pdb to debug and set breakpoints in the code.
16. Use Python's threading module to download multiple files concurrently from different URLs.

**Total Periods : 45**

  
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**COURSE OUTCOMES:**

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

- CO1: Design and implement object-oriented Python programs,
- CO2: Use advanced Python features such as generators, decorators, and file handling techniques.
- CO3: Develop web applications using Flask, implementing routing, templating, and creating RESTful APIs.
- CO4: Interact with relational and NoSQL databases, including performing CRUD operations using SQLite
- CO5: Apply concurrency techniques, containerize applications using Docker.

**TEXT BOOKS:**

1. Abraham Silberschatz, Henry F. Korth, S. Sudarshan, "Database System Concepts", McGraw-Hill Education, 7th Edition, 2020
2. Carlos Coronel, Steven Morris, "Database Systems: Design, Implementation, and Management", Cengage Learning, 13th Edition, 2022
3. Raghu Ramakrishnan, Johannes Gehrke, "Database Management Systems", McGraw-Hill Education, 3rd Edition, 2003

**REFERENCE BOOKS:**

1. Eric Redmond, Jim R. Wilson, "Seven Databases in Seven Weeks: A Guide to Modern Databases and the NoSQL Movement", Pragmatic Bookshelf, 2nd Edition, 2018

**CO's-PO's & PSO's Mapping**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS01	PS02
1	1	1	3	2	2	-	-	-	1	-	3	2	-	-
2	1	-	2	1	2	-	-	-	1	-	3	2	-	-
3	1	1	3	2	2	-	-	-	1	1	3	2	-	-
4	1	1	3	2	-	-	-	-	1	1	3	2	-	-
5	1	-	3	2	-	-	-	-	1	1	3	2	-	-
Avg	1	1	3	2	1	-	-	-	1	1	3	2	-	-

1-low, 2-medium, 3-high, '-' - no correlation

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